

NC School Bus Driver Training Course School Bus & Traffic Safety Section



SECTION 1

INTRODUCTION

- Federal requirement requires each state have minimum standards for the licensing of commercial drivers
- A school bus means a CMV used to transport pre-primary, primary, or secondary school students from home to school, from school to home, or to and from school-sponsored events. School bus does not include a bus used as a common carrier.

COMMERCIAL DRIVER LICENSE KNOWLEDGE TEST

- General Knowledge Test:
 - All applicants
- Passenger Transport Test:
 - All bus driver applicants
- Air Brake Test:
 - If vehicle equipped with air brakes
- School Bus Test:
 - All school bus drivers
- Only one attempt at each test is allowed per day
- All test scores are valid ninety (90) days from the test date in NCDMV computer files

COMMERCIAL DRIVER LICENSE SKILLS TEST

- Vehicle Inspection
 - Test ability to know whether vehicle is safe to drive
- Basic Vehicle Control
 - Tested on skill to control the vehicle
- On-road Test
 - Tested on skill to safely drive in a variety of traffic situations
- The skills test(s) can be taken once daily
- All test scores are valid ninety (90) days from the test date in NCDMV computer files.

AGE REQUIREMENTS FOR A, B, OR C COMMERCIAL LICENSE

- Must be 21, however, at age 18 may obtain a CDL but not eligible for Hazardous Materials Endorsement and will be restricted to drive inside North Carolina only

AGE REQUIREMENTS FOR A, B, OR C LEARNER'S PERMIT

- Must be at least 18 years of age and possess a valid North Carolina Classified A, B, or C license
- A learner's permit is valid for 180 days with a limit of two permits in two years
- If permit expired over thirty days, must retake all written tests before issuance of a second permit

MEDICAL DOCUMENTATION

- Some drivers will require medical cards
- If you are required to have a “certified” medical status and fail to provide and keep up-to-date your medical examiner’s certificate you become “not-certified” and may lose your CDL

Note: See pages 1-3 through 1-5 for information that will help you decide how to self-certify

PHYSICAL QUALIFICATIONS

- A client is physically qualified to drive a commercial motor vehicle if that person:
 - Has no loss of a foot, a leg, a hand, or an arm
 - Has no impairment of:
 - A hand or finger which interferes with prehension or power grasping; or
 - An arm, foot, or leg which interferes with the ability to perform normal tasks associated with operating a commercial motor vehicle; or any other significant limb defect or limitation which interferes with the ability to perform normal tasks associated with operating a commercial motor vehicle; or has been granted a skills performance evaluation certificate pursuant to 49 CFR, Part 391.49.
 - Has no established medical history or clinical diagnosis of diabetes mellitus currently requiring insulin for control

PHYSICAL QUALIFICATIONS

- Has no current clinical diagnosis of myocardial infarction, angina pectoris, coronary insufficiency, thrombosis, or any other cardiovascular disease of a variety known to be accompanied by syncope, dyspnea, collapse, or congestive cardiac failure
- Has no established medical history or clinical diagnosis of a respiratory dysfunction likely to interfere with his/her ability to control and drive a commercial motor vehicle safely
- Has no current clinical diagnosis of high blood pressure likely to interfere with his/her ability to operate a commercial motor vehicle safely.
- Has no established medical history or clinical diagnosis of rheumatic, arthritic, orthopedic, muscular, neuromuscular, or vascular disease which interferes with his/her ability to control and operate a commercial motor vehicle safely.

PHYSICAL QUALIFICATIONS

- Has no established medical history or clinical diagnosis of epilepsy or any other condition which is likely to cause loss of consciousness or any loss of ability to control a commercial motor vehicle.
- Has no mental, nervous, organic, or functional disease or psychiatric disorder likely to interfere with his/her ability to drive a commercial motor vehicle safely.
- Has a minimum distant visual acuity of 20/40 (Snellen) in each eye with or without corrective lenses, field of vision of at least 70 degrees in the horizontal meridian in each eye, and the ability to recognize colors of traffic signals and devices showing standard red, green, and amber.

PHYSICAL QUALIFICATIONS

- First perceives a forced whispered voice in the better ear at not less than 5 feet with or without the use of a hearing aid or,
- Does not use any drug or substance identified in 21 CFR 1308.11 Schedule I, an amphetamine, a narcotic or other habit-forming drug.
Does not use any non-Schedule I drug or substance that is identified in the other Schedules in 21 part 1308 except when the use is prescribed by a licensed medical practitioner, as defined in §382.107, who is familiar with the driver's medical history and has advised the driver that the substance will not adversely affect the driver's ability to safely operate a commercial motor vehicle.
- Has no current clinical diagnosis of alcoholism.

CDL DISQUALIFICATIONS

- It is illegal to operate a CMV if your blood alcohol concentration (BAC) is .04% or more
- If you operate a CMV, you shall be deemed to have given consent to alcohol testing
- Serious Traffic Violations:
 - Excessive speeding (15 mph or more above the posted limit)
 - Reckless driving
 - Improper or erratic lane changes
 - Following a vehicle too closely
 - Traffic offenses committed in a CMV in connection with fatal traffic accidents
 - Driving a CMV without obtaining a CDL or having a CDL in the driver's possession
 - Driving a CMV without the proper class of CDL and/or endorsements

CDL DISQUALIFICATIONS

- Traffic violations in your personal vehicle:
 - If your privilege to operate your personal vehicle is revoked, cancelled, or suspended due to violations of traffic control laws (other than parking violations) you will also lose your CDL driving privileges
 - If your privilege to operate your personal vehicle is revoked, cancelled, or suspended due to alcohol, controlled substance or felony violations, you will lose your CDL for 1 year. If you are convicted of a second violation in your personal vehicle or CMV you will lose your CDL for life

OTHER CDL RULES

- You cannot have more than one license.
- No matter what type of vehicle you are driving:
 - You must notify your employer within 30 days of conviction for any traffic violations (except parking).
 - You must notify your motor vehicle licensing agency within 30 days if convicted in any other jurisdiction of any traffic violation (except parking).
 - You must notify your employer within two business days if your license is suspended, revoked, or canceled, or if you are disqualified from driving
- You must give your employer information on all driving jobs you have held for the past 10 years.

OTHER CDL RULES

- No one can drive a commercial motor vehicle without a CDL
- If you have a hazardous materials endorsement you must notify and surrender your hazardous materials endorsement to the state that issued your CDL within 24 hours of any conviction or indictment in any jurisdiction, civilian or military, for, or found not guilty by reason of insanity of a disqualifying crime listed in 49 CFR 1572.103; who is adjudicated as a mental defective or committed to a mental institution as specified in 49 CFR 1572.109; or who renounces his or her U. S. citizenship;
- Your employer may not let you drive a commercial motor vehicle if you have more than one license or if your CDL is suspended or revoked

OTHER CDL RULES

- All states are connected to one computerized system to share information about CDL drivers. The states will check on drivers' accident records to be sure that drivers do not have more than one CDL
- You must be properly restrained by a safety belt at all times while operating a commercial motor vehicle

OTHER SAFETY ACTS RULES

- At the time you obtain your CDL, you will be issued a Temporary Driving Certificate (TDC). Retain your previous driver license and/or permit for identification purposes only
- Anyone who holds a commercial driver license automatically agrees to chemical analysis. Consent is implied.
- A commercial driver will be suspended and CDL disqualified for one year if he/she willfully refuses a chemical analysis

OTHER SAFETY ACTS RULES

- You will lose your CDL for at least thirty (30) days based on an immediate civil revocation if you are driving a commercial motor vehicle and the test reveals an alcohol concentration of 0.04 or more. This suspension may be extended indefinitely until the driver satisfies any requirements the court imposes regarding the civil revocation.
- If your alcohol concentration is less than 0.04 percent but you have any detectable amount on your breath, you will immediately be placed out of service for twenty-four (24) hours.

OTHER SAFETY ACTS RULES

- Your CDL will be disqualified for ten (10) days if you are convicted of a first offense of driving a commercial motor vehicle after consuming alcohol or while alcohol remains in your body.
- You will be CDL disqualified for one (1) year for a civil revocation under G.S. 20-16.5 or a substantially similar revocation obtained in another jurisdiction, arising out of a charge that occurred while the person was either operating a commercial motor vehicle or while the person was holding a commercial drivers license.

OTHER SAFETY ACTS RULES

- A conviction of a first offense of any of the following will affect your privilege to drive:
 - Driving while impaired (alcohol concentration of 0.08) by a CDL holder in any type of vehicle; one year suspension and disqualification
 - Driving while impaired (alcohol concentration 0.04) in a CMV; one year suspension and disqualification
 - Leaving the scene of an accident involving a CMV you were driving; one year disqualification.
 - Using a CMV to commit a felony; one year disqualification
 - Vehicular manslaughter offense occurring while you were operating a CMV; one year suspension and disqualification
 - Driving a CMV during a period when your CDL is revoked, suspended, cancelled, or you are otherwise disqualified from operating a CMV; one year disqualification and depending on the charged offense, your privilege to drive may also be suspended

OTHER SAFETY ACTS RULES

- If the offense occurs while you are operating a CMV that is placarded for hazardous materials, you will be CDL disqualified for at least three (3) years.
- **You will be CDL disqualified for life for conviction of a second offense of any of the above mentioned violations.**
- You will also be CDL disqualified for life if you use a CMV to commit a felony
- You will lose your CDL:
 - For at least 60 days if you have committed 2 serious traffic violations within a 3-year period
 - For at least 120 days for 3 serious traffic violations within a 3-year period

SECTION 2

DRIVING SAFELY

- This section covers:
 - Vehicle Inspection
 - Basic Control of Your Vehicle
 - Shifting Gears
 - Seeing
 - Communicating
 - Space Management
 - Controlling Your Speed
 - Seeing Hazards
 - Distracted Driving
 - Aggressive Drivers/Road Rage
 - Night Driving & Driver Fatigue
 - Driving in Fog
 - Winter Driving
 - Hot Weather Driving
 - Railroad-highway Crossings
 - Mountain Driving
 - Driving Emergencies
 - Antilock Braking Systems
 - Skid Control and Recovery
 - Accident Procedures
 - Fires
 - Alcohol, Other Drugs, and Driving
 - Hazardous Materials Rules

SECTION 2

DRIVING SAFELY

- Safety is the most important reason to inspect the vehicle, safety for yourself and for other road users
- Federal and state laws require that drivers inspect their vehicles
- Federal and state inspectors also may inspect your vehicle and if they judge it unsafe, they will put it “out of service” until fixed
- The pre-trip inspection will be covered in depth during the behind the wheel training.

VEHICLE INSPECTION

- Help find problems that could cause a crash or breakdown
- Tire Problems:
 - Pressure
 - Tread
 - Front 4/32
 - Rear 2/32
 - Outer appearance for damage
 - Re-grooved, recapped, or retreaded tires are prohibited on the front wheels

VEHICLE INSPECTION

- Wheel and Rim
 - Damage
 - Rust around wheel nuts
 - Missing items means danger
- Bad Brake Drums or Shoes
 - Shoes or pads with oil, grease, or brake fluid on them
- Steering System
 - Defects
 - Steering wheel play of more than 10 degrees (approximately 2 inches of a 20-inch wheel) can make it hard to steer

VEHICLE INSPECTION

- Suspension system
 - Broken suspension can be extremely dangerous
 - Missing or broken leaves in any leaf spring
 - If one-fourth or more missing, it will put the vehicle out of service but any defect is dangerous
- Exhaust system
 - A broken exhaust system can let poison fumes into the cab or sleeper berth
- Emergency Equipment
 - Fire extinguisher
 - Spare electrical fuses
 - Warning devices (three reflective triangles)

VEHICLE INSPECTION

- Cargo
 - Make sure truck is not overloaded, and the cargo is balanced and secured before each trip
- Approaching the Vehicle
 - Notice general condition
- Review last vehicle inspection report
 - You must sign the report only if defects were noted and certified to be repaired or repair was not needed

VEHICLE INSPECTION

- Engine compartment
 - You may have to raise the hood, tilt the cab (secure loose things so they don't fall and break something), or open the engine compartment door
 - Check fluid levels and look for leaks
 - Cracked, worn electrical wiring
- Start engine and inspect inside
 - Start engine and listen for unusual noises
 - Look at gauges, ensure they begin gradual rise to normal operating range
 - Check control conditions
 - Check mirrors and windshield
 - Safety belt

VEHICLE INSPECTION

- Walk around
 - Check all lights (Note: Checks for brake, turn signal and four-way flasher functions must be done separately)
 - Walk around and inspect all four sides of the vehicle
 - Test for hydraulic brake leaks
 - Pump the pedal three times
 - Apply firm pressure to the brake pedal and hold for five seconds
 - The pedal should not move

VEHICLE INSPECTION

- During a trip
 - If you see, hear, smell, or feel anything that might mean trouble, check it out
- After-trip
 - Report anything affecting safety or possibly leading to mechanical breakdown

BASIC CONTROL OF YOUR VEHICLE

- You must be able to control a vehicle's speed and direction
- Safe operation of a commercial vehicle requires skill in:
 - Accelerating
 - Steering
 - Stopping
 - Backing Safely

BASIC CONTROL OF YOUR VEHICLE

- Fasten your seatbelt when on the road



Seatbelt

- Apply the parking brake when you leave your vehicle

Pull to apply Parking Brake



ACCELERATING

- Don't roll back when you start.
- Manual transmission
 - Partly engage the clutch before taking right foot off the brake
 - Put on the parking brake whenever necessary to keep from rolling back. Release the parking brake only when you have applied enough engine power to keep from rolling
- Speed up smoothly and gradually.
- Rough acceleration
 - Cause mechanical damage
 - When pulling a trailer, can damage coupling
- Speed up very gradually when traction is poor, as in rain or snow. Too much power, and the drive wheels may spin and you could lose control.
- If the drive wheels begin to spin, take your foot off the accelerator.

STEERING

- Hold the steering wheel firmly with both hands.
- Hands should be on opposite sides of the wheel.
- If you hit a curb or pothole (chuckhole), the wheel could pull away unless you have firm hold



STOPPING

- Push the brake pedal down gradually



- Control the pressure so the vehicle comes to a smooth, safe stop

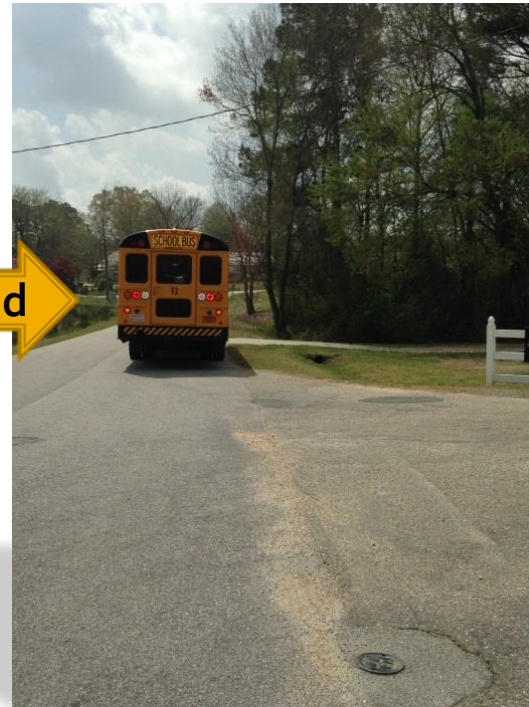
BACKING SAFELY

- Backing is always dangerous and should be avoided whenever you can.
- When parking, try to park so you will be able to pull forward when leaving
- When you have to back, use simple safety rules:
 - Start in the proper position.
 - Look at your path.
 - Use mirrors on both sides.
 - Back slowly.
 - Back and turn toward the driver's side whenever possible.
 - Use a helper.

START IN PROPER POSITION

- Put the vehicle in the best position to allow you to back safely.
- This position will depend on the type of backing to be done.

Right Side Road Turn Around



LOOK AT YOUR PATH

- Look at your line of travel before you begin
- Check your clearance to the sides and overhead, in and near the path your vehicle will take



USE MIRRORS ON BOTH SIDES

- Frequently check the outside mirrors on both sides



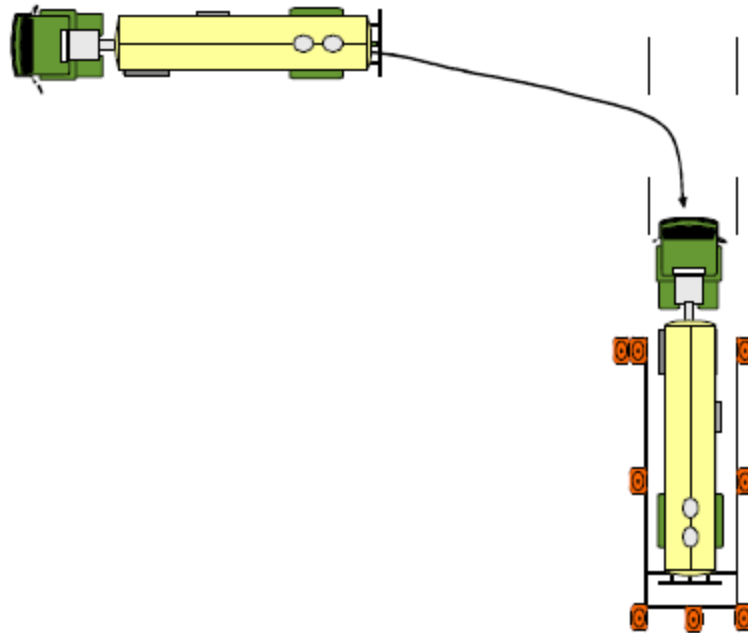
BACK SLOWLY

- Always back as slowly as possible
 - Allows you to easily correct any steering errors
 - Allows you to stop quickly if necessary



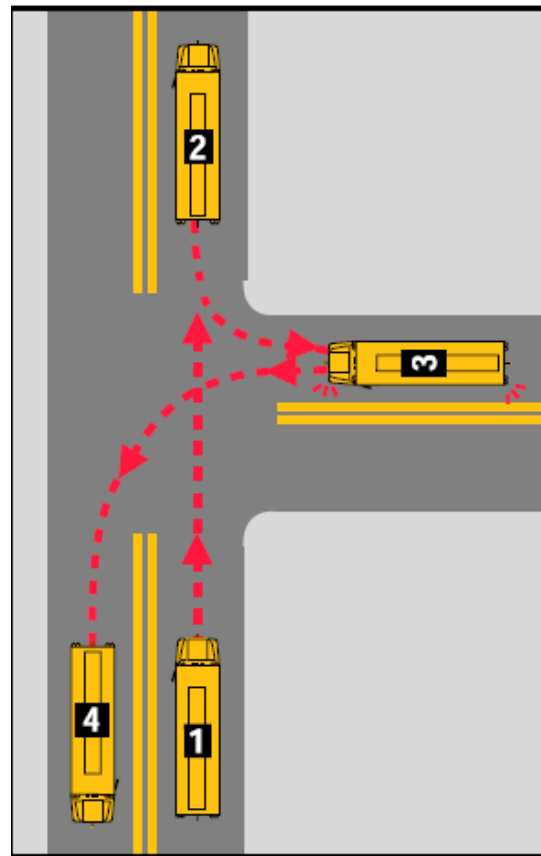
BACK AND TURN TOWARD THE DRIVER'S SIDE

- Back and turn toward the driver's side
 - Allows you to watch the rear of the vehicle by looking out the side window

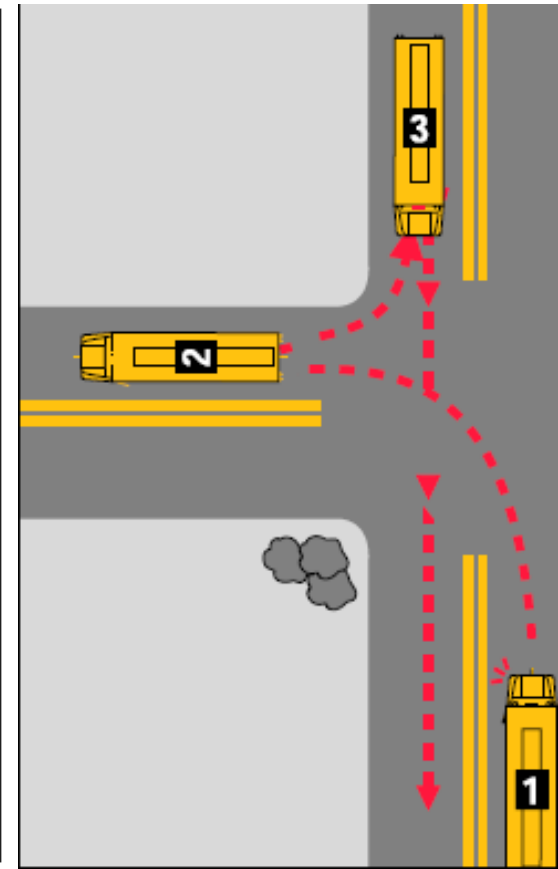


BACK AND TURN TOWARD ON ROADWAY

Note: If backing on the roadway with a school bus use either side road right or side road left



Side road (right).

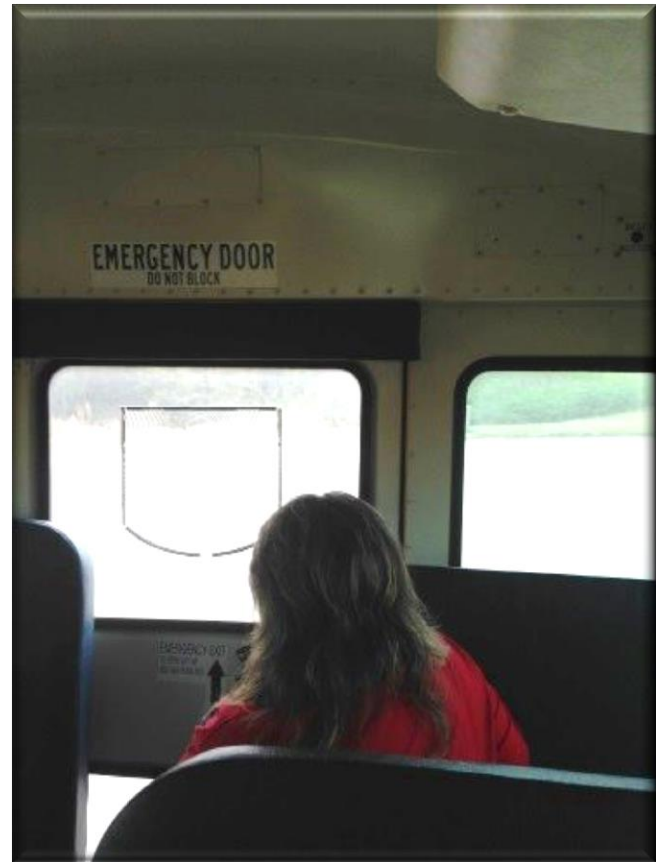


Side road (left).

USE A HELPER

- Use a helper, since there are blind spots you can't see.
- Before you begin backing, work out a set of signals that you both understand

Agree on a signal for "stop."



SHIFTING GEARS

- If you can't get your vehicle into the right gear, you will lose control
- Most heavy vehicles with manual transmissions require double clutching to change gears
- Basic method for shifting up:
 - Release accelerator, push in clutch and shift to neutral at the same time
 - Release clutch
 - Let engine and gears slow down to the rpm required for the next gear
 - Push in clutch and shift to the higher gear at the same time
 - Release clutch and press accelerator at the same time



SHIFTING GEARS

- Two ways of knowing when to shift
 - Use engine speed.
 - Watch tachometer, and shift up when engine reaches the top of the range
 - Use road speed.
 - Learn what speeds each gear is good for and then use the speedometer to know when to shift



SHIFTING GEARS

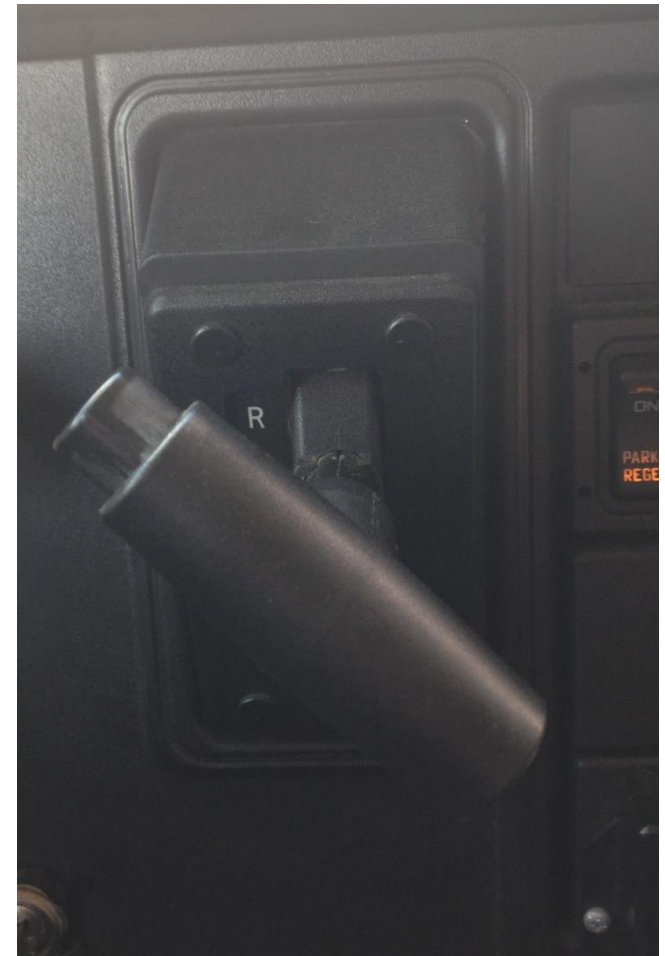
- Basic procedures for shifting down
 - Release accelerator, push in clutch, and shift to neutral at the same time
 - Release clutch
 - Press accelerator, increase engine and gear speed to the rpm required in lower gear
 - Push in clutch and shift to lower gear at the same time
 - Release clutch and press accelerator at the same time
 - Use either the tachometer or the speedometer and downshift at the right rpm or road speed

SHIFTING GEARS

- Where you should downshift
 - Before starting down a hill.
 - Usually lower than the gear required to climb the same hill
 - Before entering a curve.
 - Slow down to a safe speed, and downshift to the right gear before entering the curve
- Multi-speed rear axles and auxiliary transmissions are used to provide extra gears.
 - Control them by a selector knob or switch on the gearshift lever of the main transmission

AUTOMATIC TRANSMISSIONS

- Select a low range to get greater engine braking when going down grades
- Lower ranges prevent the transmission from shifting up beyond the selected gear (unless the governor rpm is exceeded)



RETARDERS

- Retarders help slow a vehicle, reducing the need for using brakes.
- They reduce brake wear and give another way to slow down
- There are four basic types:
 - Exhaust
 - Engine
 - Hydraulic
 - Electric
- All retarders can be turned on or off by the driver.
 - On some vehicles the retarding power can be adjusted.
 - When turned "on," retarders apply their braking power (to the drive wheels only) when the accelerator pedal is released all the way
 - These devices can be noisy, be sure you know where use is permitted.

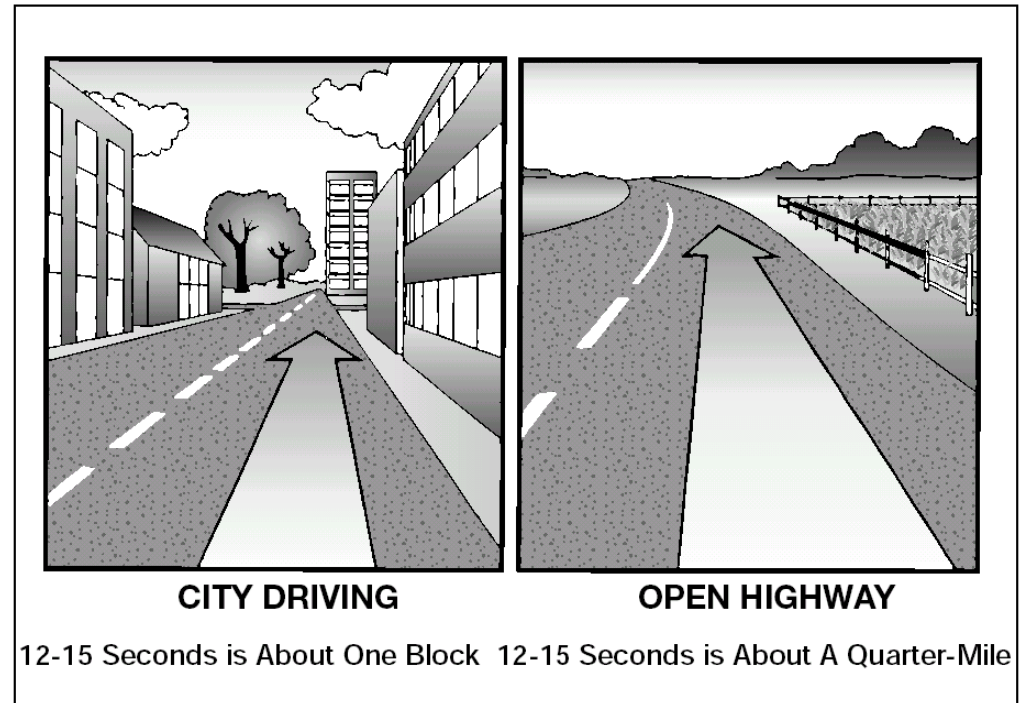
Caution. When drive wheels have poor traction, the retarder may cause them to skid. Therefore, turn the retarder off whenever the road is wet, icy, or snow covered.

SEEING

- You need to know what's going on all around your vehicle.
- All drivers look ahead; but many don't look far enough, which is important because:
 - Stopping or changing lanes can take a lot of distance,
 - Knowing what traffic is doing on all sides is very important.
 - You need to look well ahead to make sure you have room to make these moves safely.

SEEING

- Most good drivers look at least 12 to 15 seconds ahead.
 - At lower speeds, that's about one block.
 - At highway speeds it's about a quarter of a mile.
- Also, pay attention to things that are closer.
- Good drivers shift their attention back and forth, near and far.



SEEING

- Look for traffic
 - Vehicles coming onto the highway, into your lane, or turning.
 - Brake lights from slowing vehicles.
 - By seeing these things far enough ahead, you can avoid a problem.
- If a traffic light has been green for a long time it will probably change before you get there
 - Start slowing down and be ready to stop.



SEEING

- Check mirrors regularly
- Mirror adjustment should be checked prior to the start of any trip and can only be checked accurately when trailer is straight
- Adjust each mirror to show some part of the vehicle.



SEEING

- Make regular checks of mirrors to be aware of traffic and to check your vehicle
- Check mirrors for vehicles on either side and in back
 - In an emergency you know whether a quick lane change can be made
- Use mirrors to spot overtaking vehicles

There are "blind spots" that your mirrors cannot show you

SEEING

- Check your mirrors regularly to know where other vehicles are around you, and to see if they move into your blind spots



SEEING

- Use mirrors
 - To keep an eye on the tires to spot a tire fire
 - If carrying open cargo
 - Look for loose straps, ropes, or chains
 - Watch for flapping or ballooning tarps

SEEING

- Special situations require more than regular mirror checks:
 - Lane changes
 - Turns
 - Merges
 - Tight maneuvers



CHECKING MIRRORS

- Before you change lanes to make sure there is enough room
- After you have signaled, check that no one has moved into your blind spot
- Right after you start the lane change, to double-check that your path is clear
- After you complete the lane change

CHECKING MIRRORS

- Turns
 - Make sure the rear of the vehicle will not hit anything.



CHECKING MIRRORS

- Merging
 - Make sure the gap in traffic is large enough for you to enter safely



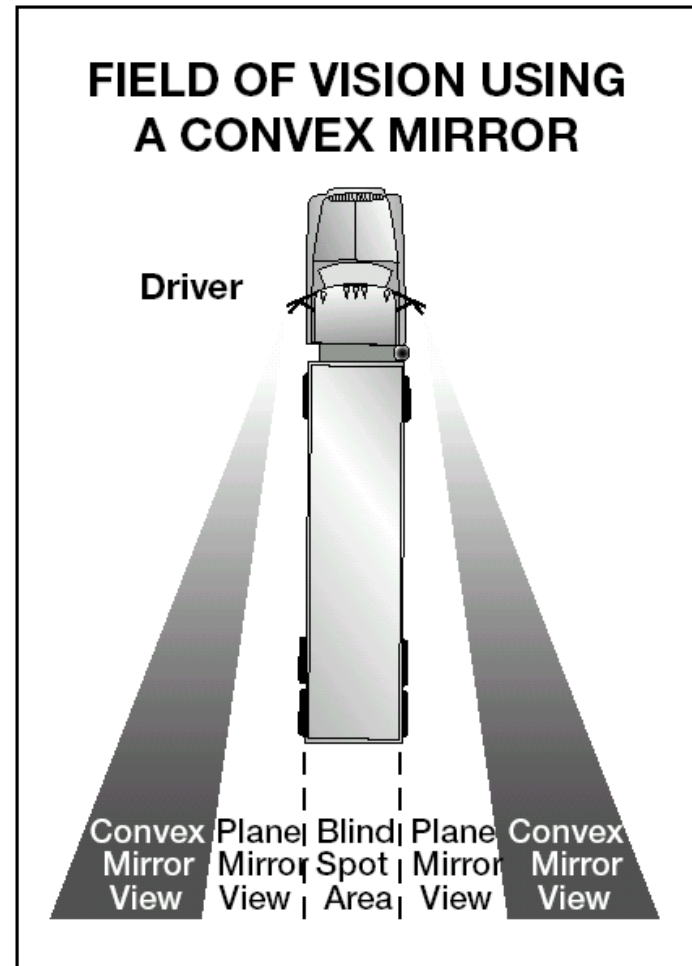
CHECKING MIRRORS

- Tight maneuvers
 - Make sure you have enough clearance while driving in close quarters



CHECKING MIRRORS

- Check quickly
- Look back and forth between mirrors and the road ahead
- Don't focus too long
- Curved (convex, "fisheye", "spot", "bug-eye") mirrors show wider area but everything appears smaller in a convex mirror and also seem farther away than they really are



COMMUNICATING

Signaling what you intend to do is important for safety

- Turns

- Signal early
- Signal continuously.
- Don't cancel the signal until the turn is completed.
- Cancel your signal.

COMMUNICATING

- Lane changes
 - Put your turn signal on before changing lanes.
 - Change lanes slowly and smoothly



COMMUNICATING

- Warn drivers behind you when you see you'll need to slow down.
 - A few light taps on the brake pedal -- enough to flash the brake lights -- should warn following drivers.
 - Use the four-way emergency flashers for times when you are driving very slowly or are stopped.



COMMUNICATING

- Warn other drivers of the following situations:
 - Trouble ahead
 - The size of your vehicle may make it hard for drivers behind to see hazards ahead so flash your brake lights.
 - Tight turns
 - Brake early and slow gradually.
 - Stopping on the road
 - Truck and bus drivers sometimes stop in the roadway to unload cargo or passengers, or to stop at a railroad crossing, flash your brake lights. Don't stop suddenly.
 - Driving slowly
 - Drivers often do not realize how fast they are catching up to a slow vehicle until they are very close, turn on your emergency flashers

COMMUNICATING

- Some drivers try to help out others by signaling when it is safe to pass. **You should not do this.** You could cause an accident, be blamed, and it could cost you many thousands of dollars.

COMMUNICATING

- Whenever you are about to pass a vehicle, pedestrian, or bicyclist, assume they don't see you.
 - They could suddenly move in front of you
 - When it is legal, tap the horn lightly or, at night, flash your lights from low to high beam and back
- Drive carefully enough to avoid a crash even if they don't see or hear you.

COMMUNICATING

- At dawn, dusk, in rain, or snow, you need to make yourself easier to see.
- Turn on your lights.
 - Use the headlights, not just the identification or clearance lights.
 - Use the low beams; high beams can bother people in the daytime as well as at night.



COMMUNICATING

- When you pull off the road and stop, be sure to turn on the four-way emergency flashers. This is important at night.



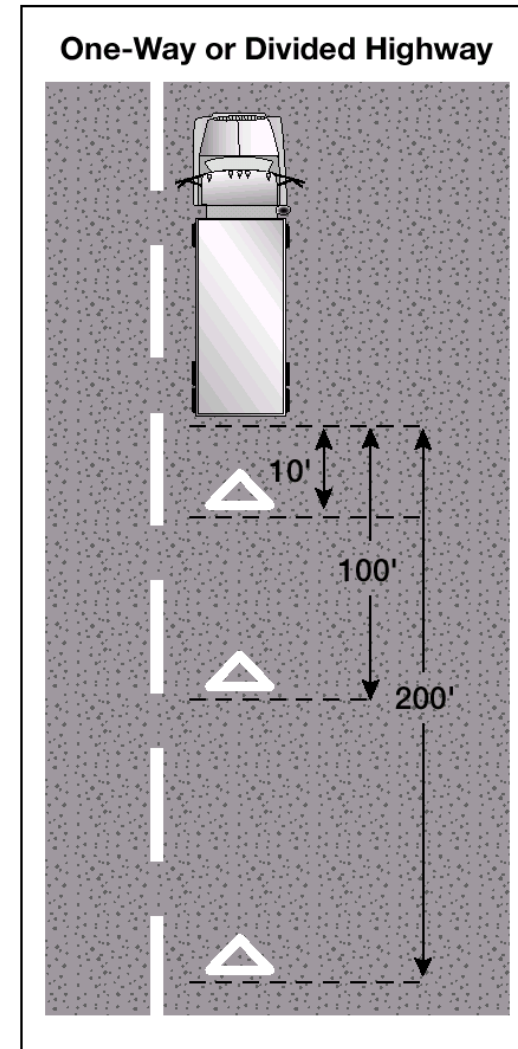
EMERGENCY WARNING DEVICES

- Drivers have crashed into the rear of a parked vehicle because they thought it was moving
- You must put out your emergency warning devices within ten minutes



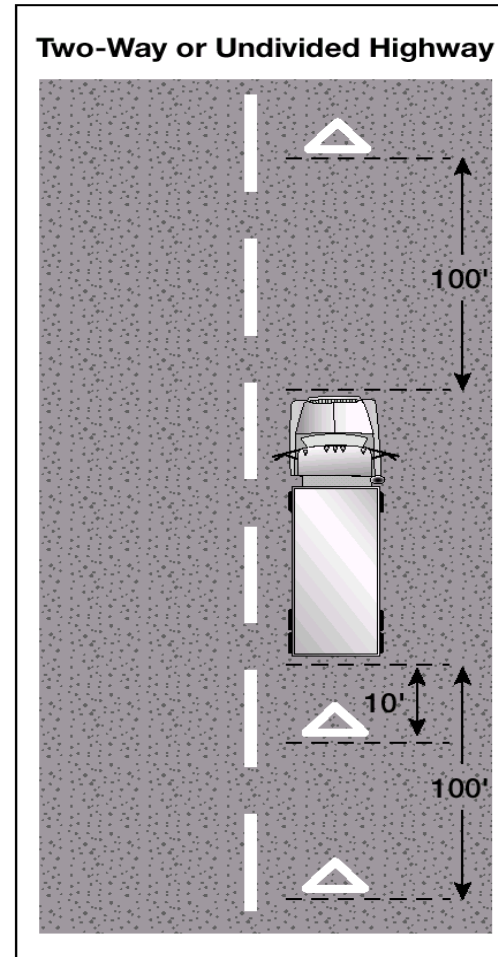
EMERGENCY WARNING DEVICES

- If you must stop on or by a one-way or divided highway, place warning devices 10 feet, 100 feet, and 200 feet toward the approaching traffic.



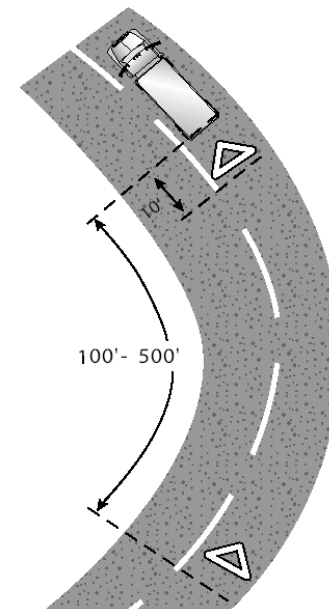
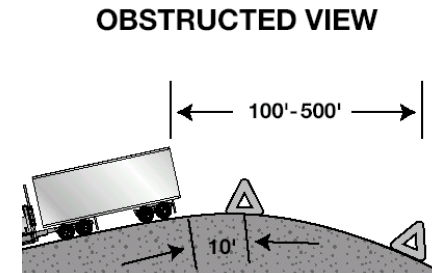
EMERGENCY WARNING DEVICES

- If you stop on a two-lane road carrying traffic in both directions or on an undivided highway, place warning devices within 10 feet of the front or rear corners to mark the location of the vehicle and 100 feet behind and ahead of the vehicle, on the shoulder or in the lane you stopped in.



EMERGENCY WARNING DEVICES

- Back beyond any hill, curve, or other obstruction that prevents other drivers from seeing the vehicle within 500 feet. If line of sight view is obstructed due to hill or curve, move the rear-most triangle to a point back down the road so warning is provided.



COMMUNICATING

- When putting out the triangles, hold them between yourself and the oncoming traffic for your own safety. So other drivers can see you.
- Use your horn when needed
- It can help avoid a crash; however, it can startle others and be dangerous used unnecessarily



Horn

SPEED

- Driving too fast is a major cause of fatal crashes
- Adjust your speed depending on driving conditions, such as:
 - Traction
 - Curves
 - Visibility
 - Traffic
 - Hills



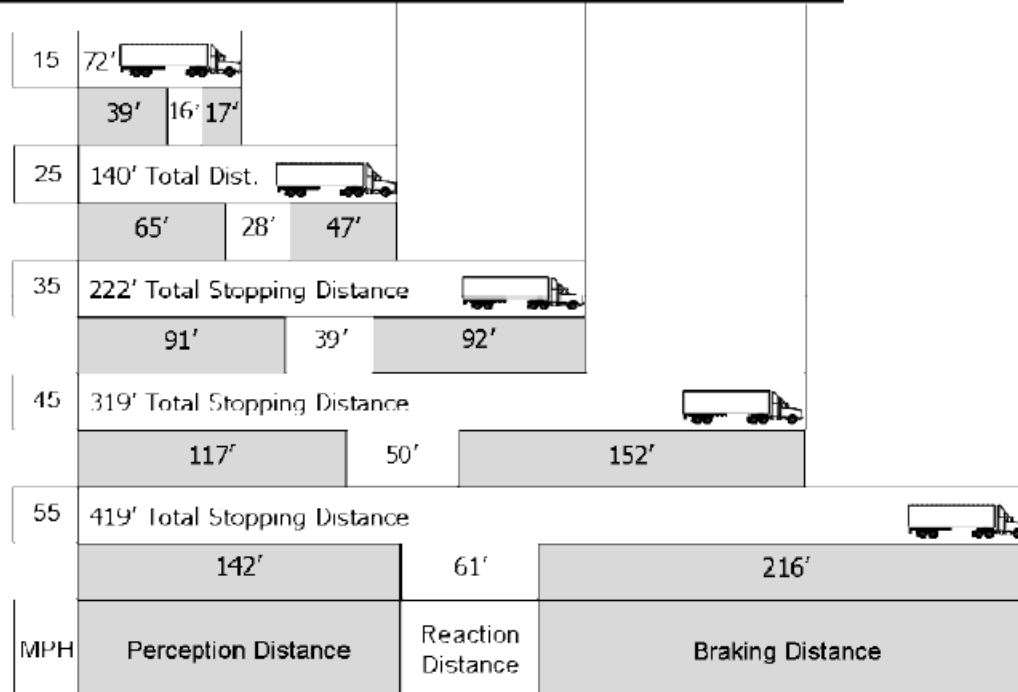
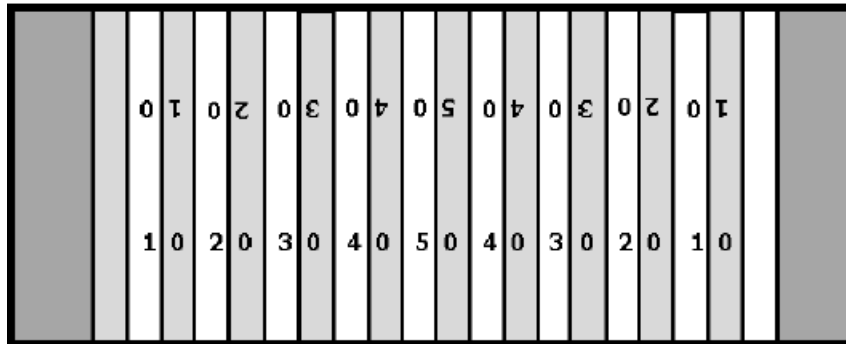
STOPPING DISTANCE

- Total stopping distance
 - Perception Distance:
 - The distance your vehicle travels, in ideal conditions; from the time your eyes see a hazard until your brain recognizes it.
 - The average driver has a perception time of $1\frac{3}{4}$ seconds.
 - At 55 mph this accounts for 142 feet traveled.
 - Reaction distance:
 - The distance you will continue to travel, in ideal conditions; before you physically hit the brakes, in response to a hazard seen ahead.
 - The average driver has a reaction time of $\frac{3}{4}$ second to 1 second.
 - At 55 mph this accounts for 61 feet traveled.

STOPPING DISTANCE

- Braking distance:
 - The distance your vehicle will travel, in ideal conditions; while you are braking.
 - At 55 mph on dry pavement with good brakes, it can take about 216 feet.
- Total stopping distance:
 - The total minimum distance your vehicle has traveled, in ideal conditions; with everything considered, including perception distance, reaction distance and braking distance, until you can bring your vehicle to a complete stop.
 - At 55 mph, your vehicle will travel a minimum of 419 feet. (That's more than the length of a football field)

STOPPING DISTANCE



STOPPING DISTANCE

- The faster you drive, the greater the impact or striking power of your vehicle.
- When you double your speed the impact is 4 times greater and braking distance is 4 times longer.
- Triple the speed, impact and braking distance is 9 times greater.
- At 60 mph, your stopping distance is greater than the length of a football field.
- At 80 mph the impact and braking distance are 16 times greater than at 20 mph.
- High speeds greatly increase the severity of crashes and stopping distances. By slowing down, you can reduce braking distance.

STOPPING DISTANCE

- The heavier the vehicle, the more work the brakes must do to stop it, and the more heat they absorb.
- Brakes, tires, springs, and shock absorbers on heavy vehicles are designed to work best when the vehicle is fully loaded.
- Empty trucks require greater stopping distances because an empty vehicle has less traction. This is not normally the case for buses.

MATCHING SPEED TO ROAD SURFACE

- You can't steer or brake a vehicle unless you have traction.
- Traction is friction between the tires and the road
- It will take longer to stop, and it will be harder to turn without skidding, when the road is slippery.
- Reduce speed:
 - Wet roads can double stopping distance, reduce speed by about one-third (e.g., slow from 55 to about 35 mph) on a wet road.
 - On packed snow, reduce speed by a half, or more.
 - If the surface is icy, reduce speed to a crawl and stop driving as soon as you can safely do so.

SLIPPERY SURFACES

- Ice: Appears first and stays longer
 - Shady parts of the road
 - Bridges will freeze before the road will
- Melting ice (wet ice) is much more slippery than ice that is not wet
- Black ice is a thin layer making the road look wet. Any time the temperature is below freezing and the road looks wet, watch out for black ice.
- If ice on mirrors, mirror support, or antenna, the road surface is probably starting to ice up.

SLIPPERY SURFACES

- Right after it starts to rain, the water mixes with oil left on the road and makes the road very slippery.
- Water or slush can cause vehicle to hydroplane
 - It is like water skiing--the tires lose their contact with the road and have little or no traction.
 - Regain control by releasing the accelerator and pushing in the clutch to slow your vehicle and let the wheels turn freely.

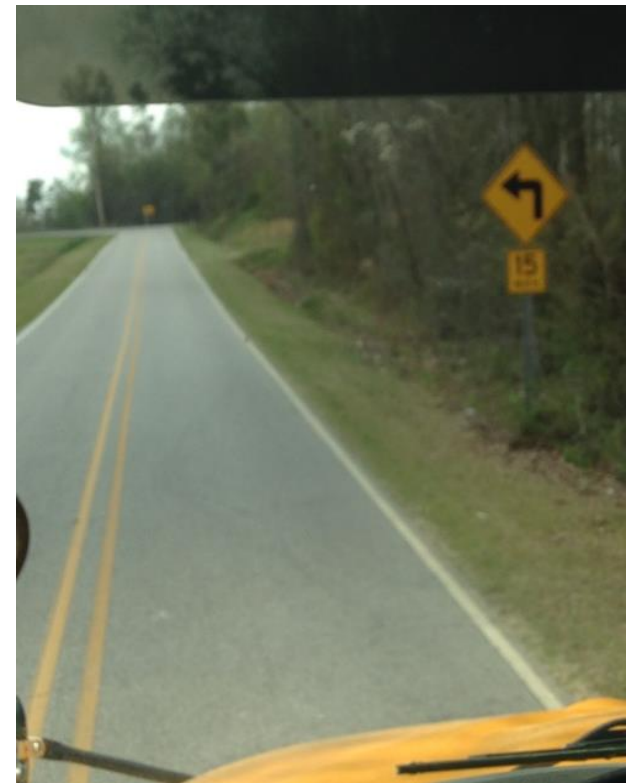


SLIPPERY SURFACES

- Hydroplaning:
 - Do not use the brakes to slow down.
 - If drive wheels start to skid, push in the clutch to let them turn freely.
 - Does not take a lot of water.
 - Can occur at speeds as low as 30 mph
 - More likely if tire pressure is low, or the tread is worn.
 - Road surfaces where water can collect can create conditions that cause a vehicle to hydroplane.

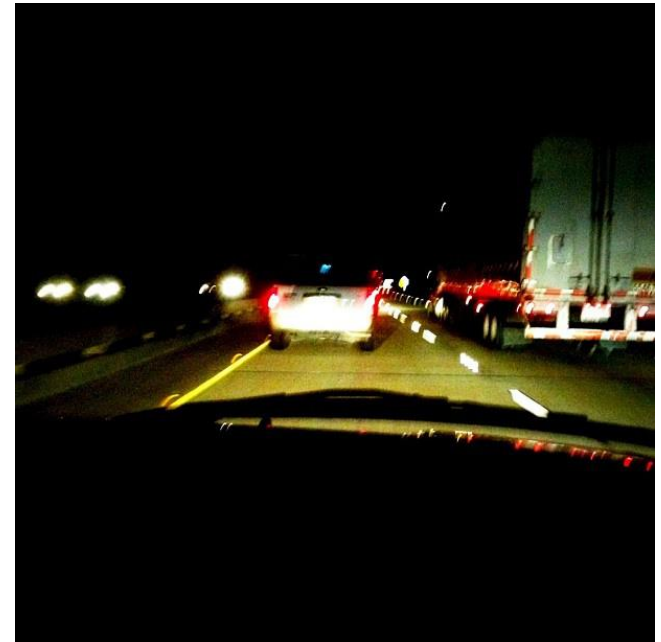
SPEED AND CURVES

- Adjust speed
 - If too fast, tires can lose their traction and continue straight ahead,
 - Or, tires may keep their traction and the vehicle rolls over.
- Don't ever exceed the posted speed limit for the curve.
 - High center of gravity can cause the vehicle to roll over at the posted speed limit
- Slow to a safe speed before entering a curve.
 - Braking in a curve is dangerous because it is easier to lock the wheels and cause a skid.
- Be in a gear that will let you accelerate slightly in the curve.



SPEED AND DISTANCE AHEAD

- Always be able to stop within the distance you can see ahead.
 - At night, you can't see as far with low beams as you can with high beams.
 - When you must use low beams, slow down.
 - Fog, rain, or other conditions may require that you slowdown



SPEED AND TRAFFIC FLOW

- When driving in heavy traffic, the safest speed is the speed of other vehicles.
- Drive at the speed of the traffic, if you can without going at an illegal or unsafe speed.
- Keep a safe following distance.
- Use extra caution when you change lanes or pass



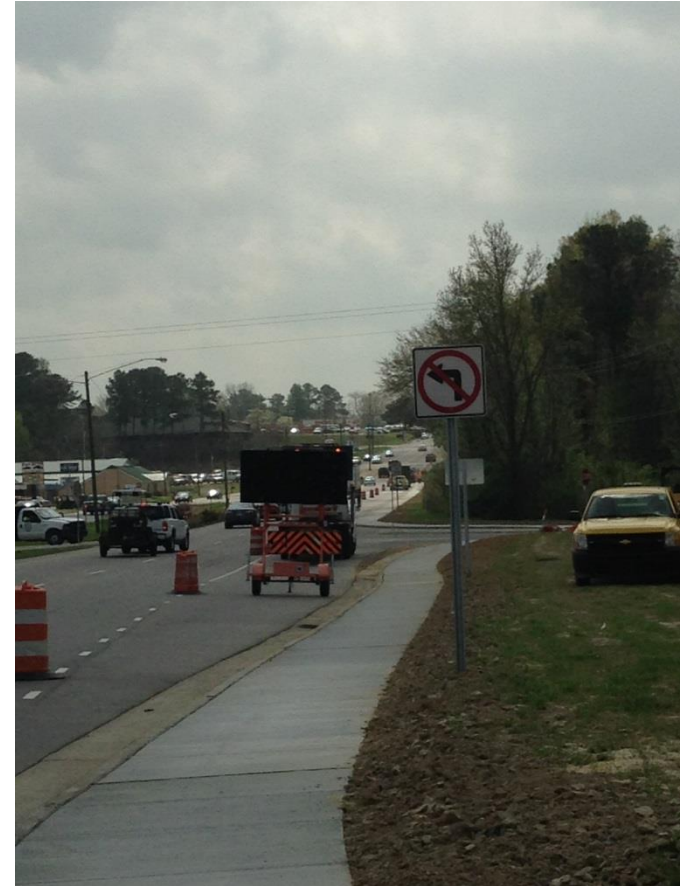
SPEED ON A DOWNGRADE

- If a speed limit is posted, or there is a sign indicating "Maximum Safe Speed," never exceed the speed shown.
- Use the braking effect of the engine as the principal way of controlling your speed on downgrades.
- Save your brakes so you will be able to slow or stop as required by road and traffic conditions.

More will be discussed in "Mountain Driving."

ROADWAY WORK ZONES

- Speeding traffic is the number one cause of injury and death
- Observe the posted speed limits at all times when approaching and driving through a work zone.
- Watch your speedometer, and don't allow your speed to creep up
- Decrease your speed for adverse weather or road conditions.
- Decrease your speed even further when a worker is close to the roadway.



SPACE

- To be a safe driver, you need space all around your vehicle. Space gives you time to think and take action
- Large vehicles take up more space and require more space for stopping and turning

Of all the space around your vehicle, it is the area ahead of the vehicle--the space you're driving into --that is most important

SPACE AHEAD

- You need space ahead in case you must suddenly stop.
- According to accident reports, the vehicle that trucks and buses most often run into is the one in front of them.
- Most frequent cause is following too closely.

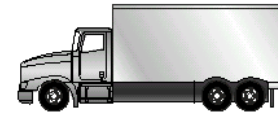
SPACE AHEAD

- You need at least one second for each 10 feet of vehicle length at speeds below 40 mph. At greater speeds, you must add 1 second for safety.
- For example, if you are driving a 40-foot vehicle, you should leave 4 seconds between you and the vehicle ahead. In a 60-foot rig, you'll need 6 seconds. Over 40 mph, you'd need 5 seconds for a 40-foot vehicle and 7 seconds for a 60-foot vehicle.

HEAVY VEHICLE FORMULA

For timed interval following distance

- 1 second required for each 10 feet of vehicle length at speeds under 40 MPH
- Above 40 MPH use same formula, then add 1 second for the additional speed



40 foot truck (under 40 MPH) = 4 seconds



50 foot truck (above 40 MPH) = 6 seconds



60 foot truck (under 40 MPH) = 6 seconds

SPACE AHEAD

- To know how much space you have, wait until the vehicle ahead passes a clear landmark.
 - Then count off the seconds: "one thousand- and-one, one thousand-and-two" and so on, until you reach the same spot.
 - Compare your count with the rule of one second for every ten feet of length.
 - If too close drop back a little and count again.
- Also remember that when the road is slippery, you need much more space to stop.

SPACE BEHIND

- Things you can do to make it safer if you are being tailgated:
 - Stay in the right lane
 - Going uphill, do not pass another slow vehicle unless you can get around quickly and safely.
 - Avoid quick lane changes
 - Increase following distance
 - Don't speed up
 - Avoid tricks, such as turn on your taillights or flash brake lights

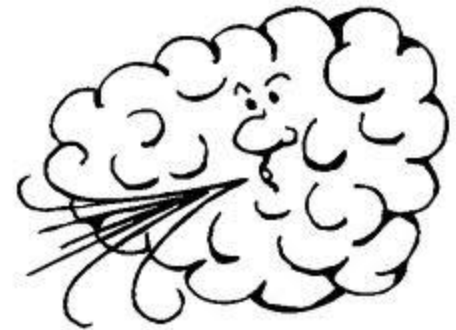
SPACE TO THE SIDES

- Commercial vehicles are often wide and take up most of a lane.
 - Stay centered in your lane
 - Avoid driving alongside others, since they may change lanes suddenly or you may be trapped if you need to change lanes
 - Find an open spot where you aren't near other traffic
 - Drop back or pull forward



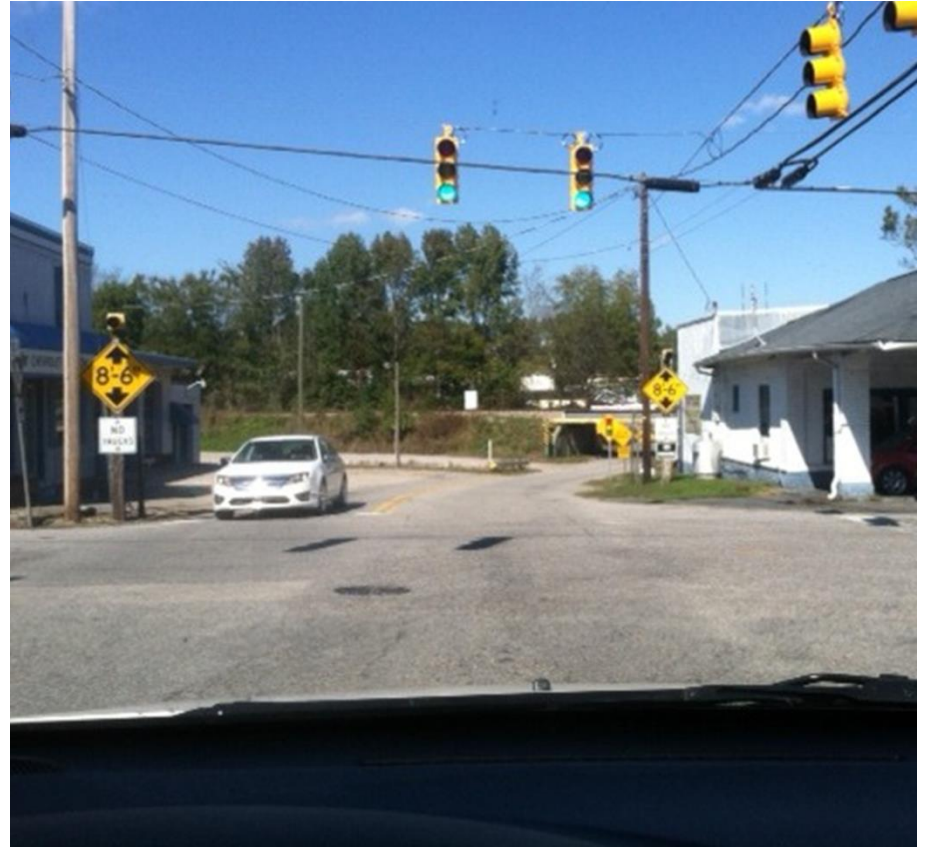
SPACE TO THE SIDES

- Strong winds make it difficult to stay in your lane.
 - Usually worse for lighter vehicles. For example a double with empty trailers.
 - Can be especially bad coming out of tunnels because of crosswinds.
 - Don't drive alongside others if you can avoid it.



SPACE OVERHEAD

- Hitting overhead objects is a danger.
 - Don't assume that the heights posted at bridges and overpasses are correct.
 - An empty van is higher than a loaded one.



SPACE OVERHEAD

- If you doubt you have safe space to pass under an object, go slowly.
- If you aren't sure you can make it, take another route.



SPACE OVERHEAD

- Some roads can cause a vehicle to tilt. There can be a problem clearing objects along the edge of the road, such as signs, trees, or bridge supports. Where this is a problem, drive a little closer to the center of the road.
- Before you back into an area, get out and check for overhanging objects such as trees, branches, or electric wires.

SPACE BELOW

- Don't forget about the space under the vehicle. That space can be very small when a vehicle is heavily loaded. This is often a problem on dirt roads and in unpaved yards.
- Don't take a chance on getting hung up.
- Drainage channels across roads can cause the ends of some vehicles to drag.
- Railroad tracks can also cause problems, particularly when pulling trailers with low underneath clearance. Don't take a chance on getting hung up halfway across.

SPACE FOR TURNS

- The space around a truck or bus is important in turns. Because of wide turning and off-tracking, large vehicles can hit other vehicles or objects during turns.



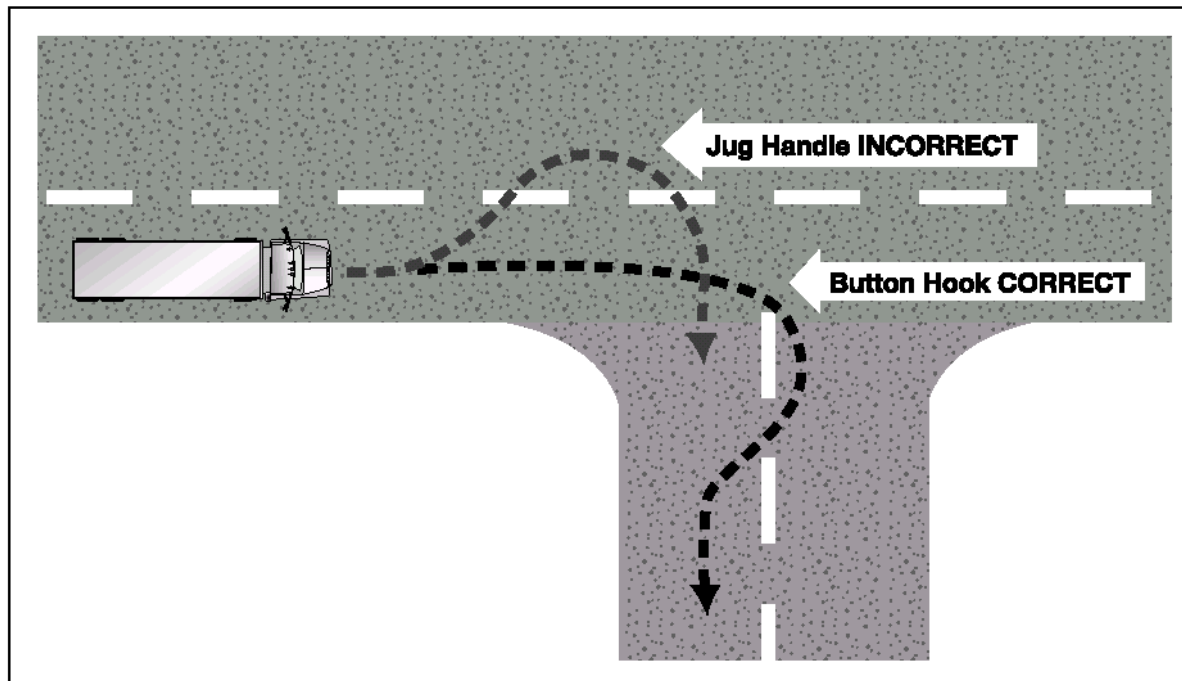
RIGHT TURNS

- Here are some rules to help prevent right-turn crashes:
 - Turn slowly.
 - Turn wide as you complete the turn.
 - Keep the rear of your vehicle close to the curb. This will stop other drivers from passing on the right.
 - Don't turn wide to the left as you start the turn. A following driver may think you are turning left and try to pass you on the right.



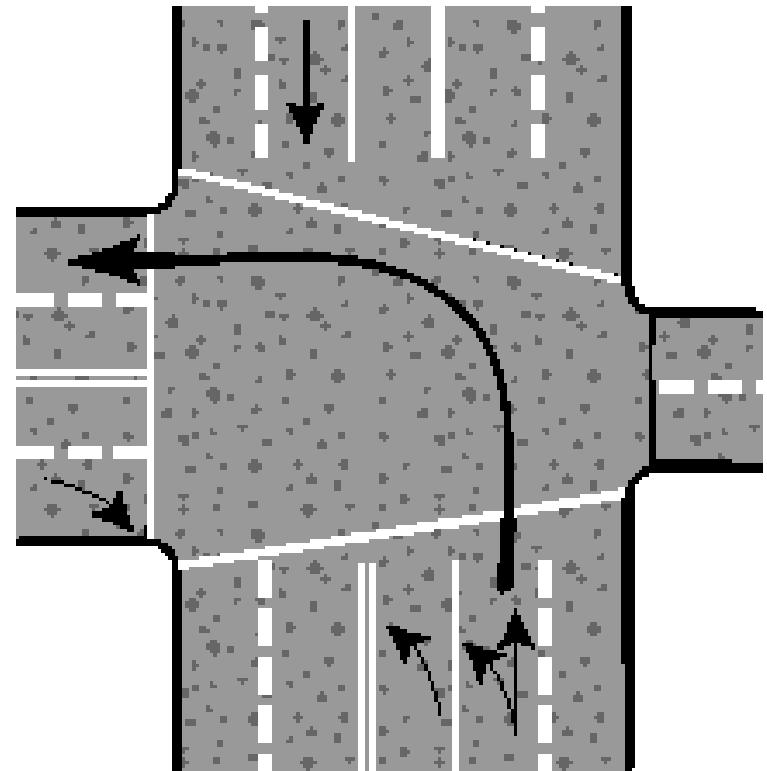
RIGHT TURNS

- If you must cross into the oncoming lane to make a turn, watch out for vehicles coming toward you. Give them room to go by or to stop. However, don't back up for them, because you might hit someone behind you.



LEFT TURNS

- On a left turn, make sure you have reached the center of the intersection before you start the left turn.
- If there are two turning lanes, always take the right turn lane.



SPACE

- Be aware of the size and weight of your vehicle when you cross or enter traffic.
 - Because of slow acceleration and the space large vehicles require, you may need a much larger gap to enter traffic than you would in a car
 - Acceleration varies with the load. Allow more room if heavily loaded.
 - Before you start across a road, make sure you can get all the way across before traffic reaches you.

HAZARDS

- A hazard is any road condition or other road user (driver, bicyclist, pedestrian) that is a possible danger.
- You will have more time to act if you see hazards before they become emergencies.
- There are often clues that will help you see hazards. The more you drive, the better you can learn to see hazards.

SEEING HAZARDS

- For example, a car in front of you is headed toward the freeway exit, but his brake lights come on and he begins braking hard.
- You might make a lane change or slow down to prevent a crash if the car suddenly cuts in front of you.
- Seeing this hazard gives you time to check your mirrors and signal a lane change. Being prepared reduces the danger

HAZARDOUS ROADS

- The incidents of law enforcement officers, emergency medical services, fire department personnel and people working on the road are being struck while performing duties at the roadside are increasing at a frightening pace.
- Move-over laws have been enacted, which require drivers to slow and change lanes when approaching a roadside incident or emergency vehicle.

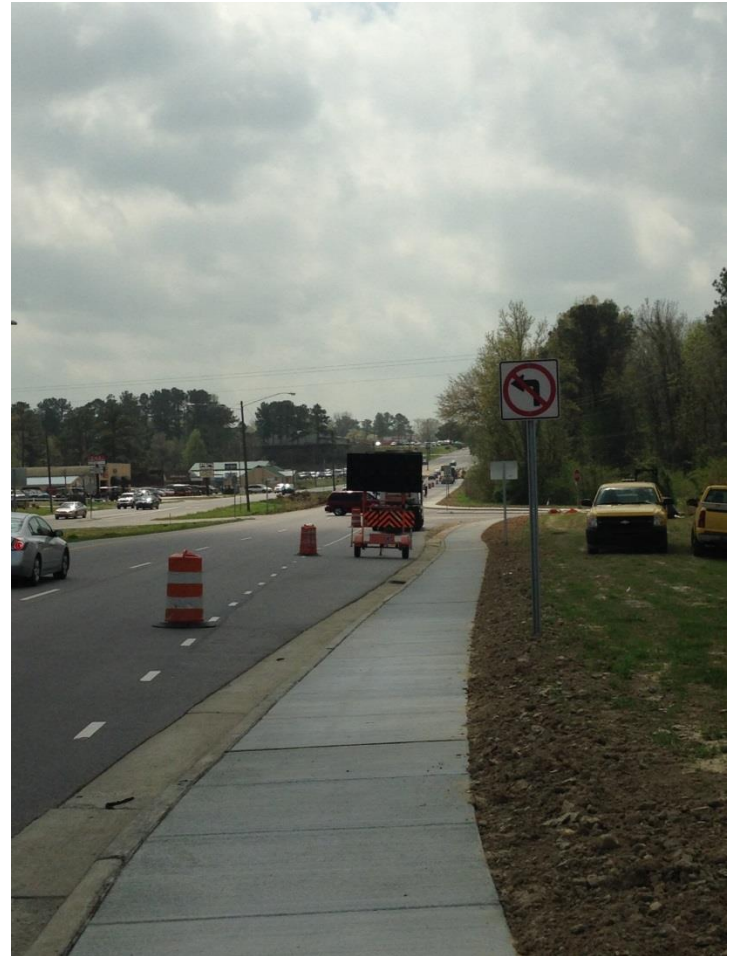
HAZARDOUS ROADS

- When approaching an authorized emergency vehicle stopped on the roadside or a work zone,
 - Proceed with caution
 - Slow and yield the right-of-way by making a lane change
 - If a lane change is unsafe, slow down and proceed with caution while maintaining a safe speed for traffic conditions



HAZARDOUS ROADS

- People working on the road, is a hazard.
 - Other drivers are often distracted and drive unsafely.
 - Workers and construction vehicles may get in the way.
 - Drive slowly and carefully near work zones. Use your four-way flashers or brake lights to warn drivers behind you.



HAZARDOUS ROADS

- Pavement may drop off sharply near the edge of the road.
 - Driving too near the edge can tilt your vehicle toward the side of the road, causing the top of vehicle to hit roadside objects
 - It can be hard to steer as you cross the drop off, going off the road, or coming back on.



Damage from light pole



HAZARDOUS ROADS

- Things that have fallen on the road can be hazards.
 - Remain alert for objects of all sorts, so you can see them early enough to avoid them without making sudden, unsafe moves.



HAZARDOUS ROADS

- Freeway and turnpike exits can be particularly dangerous.
 - Off and on ramps often have speed limit signs posted.
 - Exits that go downhill and turn at the same time can be especially dangerous.
 - Make sure you are going slowly enough before you get on the curved part of an off/on ramp



HAZARDOUS DRIVERS

- People who can't see others are a very dangerous hazard. Rental trucks should be watched carefully since they are often not used to the limited vision to the sides and rear of the truck.

- Blocked Vision
- Delivery Trucks
- Parked Vehicles
- Pedestrians and bicyclist
- Distracted people
- Children
- Talkers



HAZARDOUS DRIVERS

- Workers
- Ice Cream Trucks
- Disabled Vehicles
- Accidents
- Shoppers
- Confused drivers
 - Tourist unfamiliar with the area
 - Unexpected actions (stopping in the middle of block, changing lanes for no apparent reason, backup lights suddenly going on are all clues)
- Slow drivers
 - Some of these have the “slow moving vehicle” symbol (red triangle with orange center)
- Drivers signaling a turn
- Drivers in a hurry



HAZARDOUS DRIVERS

- Drivers who are sleepy, have had too much to drink, are on drugs, or who are ill are hazards. Look for clues:
 - Weaving across the road or drifting from side to side
 - Leaving the road.
 - Stopping at the wrong time.
 - Open window in cold weather.
 - Speeding up or slowing down suddenly, driving too fast or too slow.
 - Be alert for drunk drivers and sleepy drivers late at night.
 - Use drivers body movement as clues to hazards
 - Conflicts

HAZARDOUS DRIVERS

- Always have a plan
 - Look for hazards
 - Think about the emergencies that could develop
 - Figure out what to do
 - Be prepared to take action based on your plans
 - In this way, you will be prepared, a defensive driver who will improve your own safety as well as the safety of all road users.



DISTRACTED DRIVING

- A driver distraction is anything that takes your attention away from driving.
- Distracted driving can cause collisions, resulting in injury, death or property damage.
- Activities inside of the vehicle can distract
- Distractions can also occur outside a vehicle



EFFECTS OF DISTRACTED DRIVING

- Effects of distracted driving include:
 - Slowed perception,
 - Delayed decision making and improper action,



TYPES OF DISTRACTION

- **Physical distraction**– one that causes you to take your hands off the wheel or eyes off the road.
- **Mental distraction**– activities that take your mind away from the road,
- **Both physical and mental distraction**– even greater chance a crash could happen,

CELL/MOBILE PHONES

- Federal Motor Carrier Safety Regulations (FMCSRs) and the Hazardous Materials Regulations (HMR) restricts the use of hand-held mobile telephones by drivers of commercial motor vehicles (CMVs);



CELL/MOBILE PHONES

- The use of hand-held mobile telephones means,
 - “using at least one hand to hold a mobile telephone to conduct a voice communication;
 - “dialing a mobile telephone by pressing more than a single button”;
 - or “moving from a seated driving position while restrained by a seat belt to reach for a mobile telephone”.
- Your primary responsibility is to operate a motor vehicle safely.

TEXTING

- The Federal Motor Carrier Safety Regulations (FMCSR) prohibits texting by commercial motor vehicle (CMV) drivers while operating in interstate commerce;



TEXTING

- Texting means:
 - Manually entering text into, or reading text from, an electronic device.
- Electronic device includes, but is not limited to:
 - a cellular telephone;
 - personal digital assistant;
 - pager;
 - computer;
 - or any other device used to enter, write, send, receive, or read text.

DON'T DRIVE DISTRACTED

- Eliminate all in-vehicle distractions before driving begins.
- Based on the assessment of potential distractions, you can formulate a preventative plan to reduce/eliminate possible distractions.
 - If drivers react a half-second slower because of distractions, crashes double.

AGGRESSIVE DRIVERS/ROAD RAGE

- Aggressive driving is the act of operating a motor vehicle in a selfish, bold, or pushy manner, without regard for the rights or safety of others.
- Road rage is operating a motor vehicle with the intent of doing harm to others or physically assaulting a driver or their vehicle.

AGGRESSIVE DRIVERS/ROAD RAGE

- How you feel before you even start your vehicle has a lot to do with how stress will affect you while driving.
 - Reduce your stress before and while you drive.
 - Give the drive your full attention
 - Give other drivers the benefit of the doubt
 - Slow down and keep your following distance reasonable.
 - Don't drive slowly in the left lane of traffic
 - Avoid gestures
 - Be a cautious and courteous driver.

CONFRONTED BY AN AGGRESSIVE DRIVER

- Make every attempt to get out of their way.
- Put your pride in the back seat.
- Avoid eye contact.
- Ignore gestures and refuse to react.
- Report aggressive drivers to the appropriate authorities
- If an aggressive driver is involved in a crash farther down the road, stop a safe distance from the crash scene, wait for the police to arrive, and report the driving behavior that you witnessed.

NIGHT DRIVING

- You are at greater risk when you drive at night. Drivers can't see hazards as quickly as in daylight, so they have less time to respond.
- The problems of night driving:
 - The driver,
 - The roadway
 - The vehicle.



DRIVER FACTORS

- Good vision is critical for safe driving.
- If you need to wear glasses or contact lenses for driving, remember to:
 - Always wear them when driving.
 - Keep an extra set of corrective lenses in your vehicle.
 - Avoid using dark or tinted corrective lenses at night, even if you think they help with glare.



DRIVER FACTORS

- Drivers can be blinded for a short time by bright light. It can take several seconds to recover from glare. Even two seconds can be dangerous since a vehicle going 55 mph will travel more than half the distance of a football field.
- Fatigue is physical or mental tiredness that can be caused by physical or mental strain, repetitive tasks, illness or lack of sleep.
- Fatigued or drowsy driving is one of the leading causes of traffic collisions.

WARNING SIGNS OF FATIGUE

- Difficulty focusing, frequent blinking or heavy eyelids
- Yawning repeatedly or rubbing eyes
- Day-dreaming; or wandering/disconnected thoughts
- Trouble remembering the last few miles driven; missing exits or traffic signs
- Trouble keeping head up
- Drifting from your lane, following too closely or hitting a shoulder rumble strip
- Feeling restless and irritable
- If you notice any signs of fatigue, stop driving and go to sleep for the night or a 15-20 minute nap



RISK

- Most people are less alert at night, especially after midnight
- Many heavy motor vehicle accidents occur between midnight and 6 a.m.
- Schedule trips for the hours you are normally awake, not the middle of the night
- Keep cool, by opening the window or use the air conditioner
- Take periodic breaks – about every 100 miles or 2 hours during long trips
- Stop driving and get some rest or take a nap
 - If you are drowsy, the only safe cure is to get off the road and get some sleep.

ROADWAY FACTORS

- Poor lighting
 - Daytime is usually enough light to see well.
 - Nighttime
 - Some areas may have bright street lights, but other areas will have poor lighting.
 - On most roads you will probably have to depend entirely on your headlights.
 - Road users who do not have lights are hard to see. There are many accidents at night involving pedestrians, joggers, bicyclists, and animals.

ROADWAY FACTORS

- Traffic signals and hazards can be hard to see against a background of signs, shop windows, and other lights.
- Drive slower when lighting is poor or confusing.
- Drive slowly enough to be sure you can stop in the distance you can see ahead
- Drunk drivers and drivers under the influence of drugs are a hazard
 - Be especially alert around the closing times for bars and taverns.

VEHICLE FACTORS

- Headlights
 - Low beams you can see ahead about 250 feet and with high beams about 350-500 feet.
 - Adjust speed to keep your stopping distance within your sight distance. This means going slowly enough to be able to stop within the range of your headlights
 - Make sure your lights are clean and working.
 - Adjust headlights. If they don't point in the right direction, they won't give you a good view and they can blind other drivers. Have a qualified person make sure they are adjusted properly

VEHICLE FACTORS

- In order for you to be seen easily, the following must be clean and working properly:
 - Reflectors.
 - Marker lights.
 - Clearance lights.
 - Tail lights.
 - Identification lights.
- At night your turn signals and brake lights are even more important for telling other drivers what you intend to do.



VEHICLE FACTORS

- Keep a clean windshield and clean mirrors.
 - Bright lights at night can cause dirt on your windshield or mirrors to create a glare of its own,
 - Driving toward the sun just as it has risen or is about to set, can cause you to barely see through a windshield that seemed to look OK in the middle of the day.
 - Clean your windshield on the inside and outside for safe driving at night.

NIGHT DRIVING

- Make sure you are rested and alert.
- Make sure eyeglasses are clean and unscratched.
- Don't wear sunglasses at night.
- Glare from your headlights can cause problems for drivers
 - Dim your lights within 500 feet of an oncoming vehicle and when following another vehicle within 500 feet.

NIGHT DRIVING

- Do not look directly at lights of oncoming vehicles.
 - Look slightly to the right at a right lane or edge marking, if available.
- Use high beams when it is safe and legal to do so.
- Don't let the inside of your cab get too bright.
 - Keep the interior light off, and adjust your instrument lights as low as you can to still be able to read the gauges.



NIGHT DRIVING

- People often don't realize how close they are to falling asleep. If you look sleepy, or you just feel sleepy, stop driving! You are in a very dangerous condition. The only safe cure is to sleep.



FOG

- Fog can occur at any time. Fog is often unexpected, and visibility can deteriorate rapidly.
 - Reduce your speed.
 - Do not assume that the fog will thin out after you enter it.
 - Obey all fog-related warning signs.
 - Slow down before you enter fog.
 - Use low-beam headlights.
 - Turn on 4-way flashers.
 - Watch for vehicles on the side of the roadway.
 - Use roadside highway reflectors as guides to determine how the road may curve ahead of you.
 - Listen for traffic you cannot see.
 - Avoid passing other vehicles.
 - Don't stop along the side of the road, unless absolutely necessary.

DRIVING IN WINTER

- Cooling system must be full and there is enough antifreeze in the system to protect against freezing.
- Make sure the defrosters and heaters work.
- Make sure the windshield wiper blades are in good condition and washer works and there is washing fluid in the reservoir.

DRIVING IN WINTER

- Make sure you have enough tread on your tires (4/32 on the front and 2/32 on the rear)
 - The drive tires must provide traction to push the rig over wet pavement and through snow.
 - The steering tires must have traction to steer the vehicle.
 - Carry the right number of chains and extra cross-links and they will fit your drive tires.
 - Check the chains for broken hooks, worn or broken cross-links, and bent or broken side chains.

DRIVING IN WINTER

- Lights and reflectors are especially important during bad weather, make sure they are clean
- Remove any ice, snow, etc., from the windshield, windows, mirrors, hand holds, steps, deck plates, and radiator shutters. Use scraper, snow brush, and windshield defroster
- Make sure the winterfront is not closed too tightly.
- Exhaust system leaks are especially dangerous when cab ventilation may be poor (windows rolled up, etc.). Loose connections could permit poisonous carbon monoxide to leak into the vehicle



DRIVING

- Drive slowly and smoothly on slippery roads. If it is very slippery, you shouldn't drive at all. Stop at the first safe place.
- When first starting, get the feel of the road. Don't hurry!
- Check for ice on the road, especially bridges and overpasses.
- Make turns as gently as possible. Don't brake any harder than necessary, and don't use the engine brake or speed retarder.
- Don't pass slower vehicles unless necessary.
- Avoid having to slow down and speed up.
- Take curves at slower speeds and don't brake while in curves.
- Don't drive alongside other vehicles. Keep a longer following distance

DRIVING

- When driving in heavy rain or deep standing water, your brakes will get wet.
- Water in the brakes can cause the brakes to be weak, to apply unevenly, or to grab. This can cause:
 - Lack of braking power,
 - wheel lockups,
 - pulling to one side or the other,
 - and jackknife if you pull a trailer.



DRIVING

- Avoid driving through deep puddles or flowing water if possible. If not, you should:
 - Slow down and place transmission in a low gear.
 - Gently put on the brakes. This presses linings against the brake drums or discs and keeps mud, silt, sand, and water from getting in
 - Increase engine rpm and cross the water while keeping light pressure on the brakes.
- When out of the water, maintain light pressure on the brakes for a short distance to heat them up and dry them out.
- Make a test stop when safe to do so. If not working well, dry them out further as described above.

HOT WEATHER

■ Tires

- Check tire mounting and air pressure
- Inspect the tires every two hours or every 100 miles when driving in very hot weather.
- Air pressure increases with temperature
- Do not let air out or the pressure will be too low when tires cool off



■ Engine Oil

- Enough oil
- If you have an oil temperature gauge, make sure the temperature is within proper range while driving



HOT WEATHER

- Engine Coolant
 - Make sure enough water and antifreeze
 - Check water temperature gauge during driving
 - If gauge goes above the highest safest temperature, something may be wrong and could cause engine failure and possibly fire
 - Stop driving as soon as safely possible and try to find what is wrong



ENGINE COOLANT

- Some vehicles have sight glasses, see-through overflow containers, or recovery containers. These permit you to check the coolant level while engine is hot.
- If not part of pressurized system, the cap can be safely removed and coolant added
- Never remove cap or any part of pressurized system until system has cooled



ENGINE COOLANT

- If coolant needs to be added
 - Shut engine off
 - Wait until engine cooled
 - Protect hands
 - Turn cap slowly to first stop
 - Step back while pressure is released
 - Once all pressure released, turn and remove cap
 - Check level and add if necessary
 - Replace cap and close tightly



HOT WEATHER

- Engine Belts
 - Learn how to check v-belt tightness by pressing on the belts.
 - Loose belts will not turn water pump or fan properly and will result in overheating
- Hoses
 - A broken hose can lead to engine failure and even fire
- Tar in the road pavement frequently rises to the surface in very hot weather. Spots where tar "bleeds" to the surface are very slippery.
- High speeds create more heat for tires and the engine. The heat will increase chances of tire failure or even fire, and engine failure.

RAILROAD CROSSINGS

- Railroad-highway grade crossings are a special kind of intersection where the roadway crosses train tracks. These crossings are always dangerous.



RAILROAD CROSSINGS

- Every crossing must be approached with the expectation that a train is coming. It is extremely difficult to judge the distance of the train from the crossing as well as the speed of an approaching train.



RAILROAD CROSSINGS

- **Passive Crossings.** This type of crossing does not have any type of traffic control device. The decision to stop or proceed rests entirely in your hands. Passive crossings require you to recognize the crossing, search for any train using the tracks and decide if there is sufficient clear space to cross safely.
- **Active Crossings.** This type of crossing has a traffic control device installed at the crossing to regulate traffic at the crossing. These active devices include flashing red lights, with or without bells and flashing red lights with bells and gates.

RAILROAD CROSSINGS

- The round, black-on-yellow warning sign is placed ahead of a public railroad-highway crossing. All passenger and hazmat carrying vehicles are required to stop.



RAILROAD CROSSINGS

Pavement markings mean the same as the advance warning sign



There may be a white stop line painted on the pavement



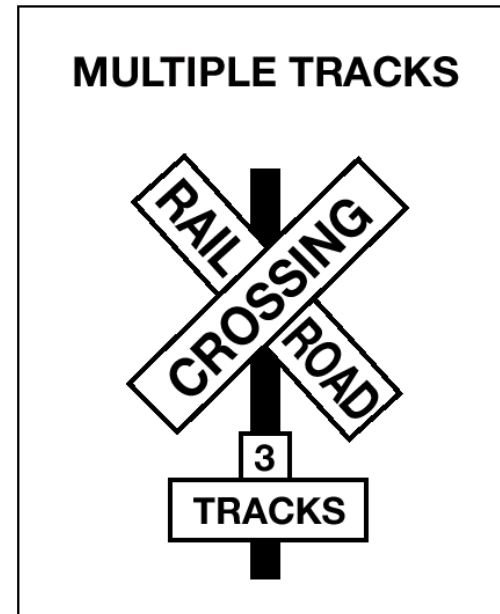
The front of the school bus must remain behind the white stop line while stopped at the crossing.

RAILROAD CROSSINGS

Cross-buck sign marks the grade crossing.



When the road crosses over more than one track, a sign below the cross-buck indicates the number of tracks



RAILROAD CROSSINGS

- Many highway-rail grade crossings, have flashing red lights and bells
- When lights begin to flash, stop! A train is approaching



RAILROAD CROSSINGS

- Many crossings have gates with flashing red lights and bells.
- Stop when lights begin to flash and remain stopped until gates go up and lights have stopped flashing



RAILROAD CROSSINGS

- Never attempt to race a train to a crossing.
- Reduce speed as you approach tracks in case a stop is necessary.
- Don't expect to hear a train.
- Reduce vehicle noise
- Don't rely on signals
- Double check double tracks. After one train has cleared be sure no other trains are near
- Yard areas and crossings in cities and towns should be approached with as much caution as double tracks

RAILROAD CROSSINGS

- A full stop is required at grade crossings whenever:
 - The nature of the cargo makes a stop mandatory under state or federal regulations.
 - Such a stop is otherwise required by law.
- When stopping be sure to:
 - Check for traffic behind you while stopping gradually.
 - Turn on your four-way emergency flashers.

RAILROAD CROSSINGS

- Railroad crossings with steep approaches can cause the unit to hang up on the tracks.
- Never permit traffic conditions to trap you in a position where you have to stop on the tracks.
- Be sure you can get all the way across the tracks before you start across.
- Do not shift gears while crossing railroad tracks.

RAILROAD CROSSINGS

- Be aware! These trailers can get stuck:
 - Low slung units
 - Single-axle pulling a long trailer with its landing gear set to accommodate a tandem-axle tractor
- If stuck on the track:
 - Get out of vehicle
 - Get away from track
 - Call 911 or other emergency number
 - Give the location of the crossing using all identifiable landmarks



MOUNTAIN DRIVING

- In mountain driving, gravity plays a major role.
 - On any upgrade, gravity slows you down.
 - In coming down long, steep downgrades, gravity causes the speed of your vehicle to increase.
 - You must select an appropriate safe speed, then use a low gear, and proper braking techniques.
- Go slowly enough so your brakes can hold you back without getting too hot.
 - If the brakes become too hot, they may start to "fade." This means you have to apply them harder and harder to get the same stopping power. If you continue to use the brakes hard, they can keep fading until you cannot slow down or stop at all.

MOUNTAIN DRIVING

- Your most important consideration is to select a speed that is not too fast for the:
 - Total weight of the vehicle and cargo.
 - Length of the grade.
 - Steepness of the grade.
 - Road conditions.
 - Weather.
- If speed limit posted, never exceed the speed shown
- Look for and heed warning signs indicating the length and steepness of the grade.
- Use the braking effect of the engine as the principal way of controlling speed. The braking effect of the engine is greatest when it is near the governed rpms and the transmission is in the lower gears



MOUNTAIN DRIVING

- Shift the transmission to a low gear before starting down the grade.
 - Do not try to downshift after your speed has already built up.
 - Forcing an automatic transmission into a lower gear at high speed could damage the transmission and also lead to loss of all engine braking effect.
- Drivers of modern trucks may have to use lower gears going down a hill than would be required to go up the hill.

MOUNTAIN DRIVING

- Brake shoes or pads rub against the brake drum or disks to slow the vehicle.
- Braking creates heat. Brakes can fade or fail from excessive heat caused by using them too much and not relying on the engine braking effect.
 - Brake fade is also affected by adjustment.
 - Brakes out of adjustment will stop doing their share before those that are in adjustment and other brakes can then overheat and fade.
 - Brakes can get out of adjustment quickly, especially when they are used a lot; also, brake linings wear faster when they are hot.
 - Brake adjustment must be checked frequently

MOUNTAIN DRIVING

- The use of brakes on a long and/or steep downgrade is only a supplement to the braking effect of the engine.
- Once the vehicle is in the proper low gear, the following are the proper braking techniques:
 - Apply the brakes just hard enough to feel a definite slowdown.
 - When your speed has been reduced to approximately five mph below your "safe" speed, release the brakes.
 - When your speed has increased to your "safe" speed, repeat steps 1 and 2.

MOUNTAIN DRIVING

- Escape ramps are made to stop runaway vehicles safely without injuring drivers and passengers.
- Know escape ramp locations on your route. Signs show drivers where ramp are located. Escape ramps save lives, equipment and cargo.



DRIVING EMERGENCIES

- Traffic emergencies occur when two vehicles are about to collide.
- Vehicle emergencies occur when tires, brakes, or other critical parts fail.



STEERING TO AVOID A CRASH

- Stopping is not always the safest thing to do in an emergency.
- When you don't have enough room to stop, you may have to steer away from what's ahead.
- Remember, you can almost always turn to miss an obstacle more quickly than you can stop.
- In order to turn quickly, you must have a firm grip on the steering wheel with both hands.

STEERING TO AVOID A CRASH

- A quick turn can be made safely, if it's done the right way. Here are some points that safe drivers use:
 - Do not apply the brake while you are turning.
 - Do not turn any more than needed to clear whatever is in your way.
 - Be prepared to "counter-steer," that is, to turn the wheel back in the other direction, once you've passed whatever was in your path. Unless you are prepared to counter-steer, you won't be able to do it quickly enough.

STEERING TO AVOID A CRASH

- Where to steer
 - If an oncoming driver has drifted into your lane, to your right is best.
 - If something is blocking your path, the best direction to steer will depend on the situation.
 - If you have been using your mirrors, you'll know which lane is empty and can be safely used.
 - If the shoulder is clear, going right may be best.
 - If you are blocked on both sides, a move to the right may be best.
 - In some emergencies, you may have to drive off the road. It may be less risky than collision with another vehicle.

LEAVING THE ROAD

- Most shoulders are strong enough to support the weight of a large vehicle.
 - Avoid using the brakes until your speed has dropped to about 20 mph. Then brake gently to avoid skidding.
 - Keep one set of wheels on the pavement, to help maintain control.
 - If shoulder is clear, stay on it until vehicle has come to a stop.
 - Signal check mirrors before pulling back onto road
 - If forced to return to the road before you can stop, use the following:
 - Hold the wheel tightly and turn sharply enough to get back on the road safely.
 - Don't try to edge gradually back on the road. If you do, your tires might grab unexpectedly and you could lose control.
 - When both front tires are on the paved surface, counter-steer immediately. The two turns should be made as a single "steer-counter-steer" move.

STOPPING QUICKLY AND SAFELY

- If somebody suddenly pulls out in front of you, your natural response is to hit the brakes. This is a good response if there's enough distance to stop, and you use the brakes correctly.
- You should brake in a way that will keep your vehicle in a straight line and allow you to turn if it becomes necessary.

STOPPING QUICKLY AND SAFELY

- **Controlled Braking.** Apply the brakes as hard as you can without locking the wheels. Keep steering wheel movements very small while doing this.
- **Stab Braking.** Apply the brakes all the way and release brakes when wheels lock up. As soon as the wheels start rolling, apply the brakes fully again. (It can take up to one second for the wheels to start rolling after you release the brakes. If you re-apply the brakes before the wheels start rolling, the vehicle won't straighten out.)
- **Don't Jam on the Brakes.** Emergency braking does not mean pushing down on the brake pedal as hard as you can. That will only keep the wheels locked up and cause a skid. If the wheels are skidding, you cannot control the vehicle.

BRAKE FAILURE

- Hydraulic brake failure
 - Loss of hydraulic pressure
 - Brake fade on long hills
- Loss of hydraulic pressure – The system won't build up pressure
 - Brake pedal feels spongy or goes to the floor
 - Downshift
 - Pump the brakes – sometimes this will generate enough hydraulic pressure to stop the vehicle
 - Use the parking brake
 - Look for an escape route
 - Open field
 - Side street
 - Escape ramp
 - Turning uphill

BRAKE FAILURE

- Brake fade on long hills
 - Go slow enough and brake properly
 - Once brakes fail, look outside the vehicle for something to stop it
 - Use escape ramp – every year, hundreds of drivers avoid injury to themselves or damage to their vehicles by using escape ramps
 - Some ramps use soft gravel that resists the motion of the vehicle and brings it to a stop
 - Some turn uphill, using the hill to stop the vehicle and soft gravel to hold it in place
 - No escape ramp
 - Open field
 - Side road that flatten out or turns uphill
- Make the move as soon as you know your brakes don't work. The longer you wait, the faster the vehicle will go and the harder it will be to stop.

TIRE FAILURE

- Quickly knowing you have a tire failure will let you have more time to react.
- The major signs of tire failure are:
 - **Sound.** The loud "bang" of a blowout is an easily recognized sign.
 - **Vibration.** If the vehicle thumps or vibrates heavily, it may be a sign that one of the tires has gone flat.
 - **Feel.** If the steering feels "heavy," it is probably a sign that one of the front tires has failed. Failure of rear tire will cause the vehicle to slide back and forth or "fishtail". Dual rear tires help prevent this
- Respond to tire failure:
 - **Hold the Steering Wheel Firmly.** If a front tire fails, it can twist the steering wheel out of your hand.
 - **Stay off the Brake.** Could cause loss of control. Stay off the brake until the vehicle has slowed down, then brake very gently, pull off the road, and stop
 - **Check the Tires.** After you've come to a stop, get out and check all the tires.

ANTILOCK BRAKING SYSTEM (ABS)

- ABS is a computerized system that keeps your wheels from locking up during hard brake applications
- Brake pressure is adjusted to provide the maximum braking without danger of lockup, so do not use stab braking with a vehicle equipped with ABS
- Tractors, trucks, and buses will have a yellow ABS malfunction lamps on the instrument panel
- ABS helps you avoid wheel lock up and maintain control

SKID CONTROL AND RECOVERY

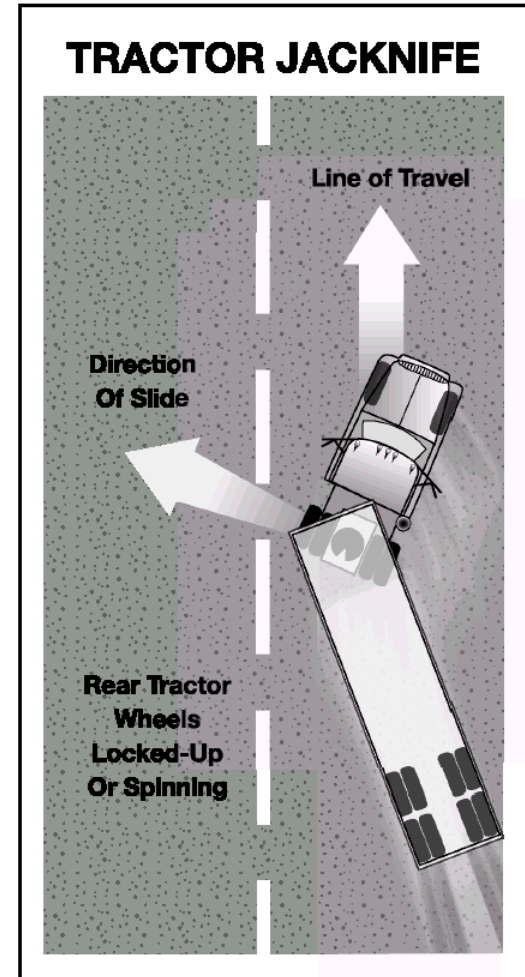
- A skid happens whenever the tires lose their grip on the road. This is caused in one of four ways:
 - **Over-braking.** Braking too hard and locking up the wheels. Skids also can occur when using the speed retarder when the road is slippery.
 - **Over-steering.** Turning the wheels more sharply than the vehicle can turn.
 - **Over-acceleration.** Supplying too much power to the drive wheels, causing them to spin.
 - **Driving Too Fast.** Most serious skids result from driving too fast for road conditions. Drivers who adjust their driving to conditions don't over-accelerate and don't have to over-brake or over-steer from too much speed.

DRIVE-WHEEL SKIDS

- By far the most common skid is one in which the rear wheels lose traction through excessive braking or acceleration. Skids caused by acceleration usually happen on ice or snow. Taking your foot off the accelerator can easily stop them.
- Rear wheel braking skids occur when the rear drive wheels lock. Because locked wheels have less traction than rolling wheels, the rear wheels usually slide sideways in an attempt to "catch up" with the front wheels. In a bus or straight truck, the vehicle will slide sideways in a "spin out."

DRIVE-WHEEL SKIDS

- With vehicles towing trailers, a drive-wheel skid can let the trailer push the towing vehicle sideways, causing a sudden jackknife.
- To correct a drive-wheel braking skid.
 - Stop braking so the rear wheels roll again.
 - Counter-steer to prevent skidding in the opposite direction



FRONT WHEEL SKIDS

- Driving too fast for conditions causes most front-wheel skids.
- Other causes include lack of tread on the front tires and cargo loaded so not enough weight is on the front axle. In a front-wheel skid, the front end tends to go in a straight line regardless of how much you turn the steering wheel.
 - Stop turning and/or braking so hard.
 - Slow down as quickly as possible without skidding.

ACCIDENT PROCEDURES

- When you're in an accident and not seriously hurt, you need to act to prevent further damage or injury.
- The basic steps to be taken at any accident are to:
 - Protect the area.
 - Notify authorities.
 - Care for the injured.

ACCIDENT PROCEDURES

- The first thing to do at an accident scene is to keep another accident from happening in the same spot.
- To protect the accident area:
 - If your vehicle is involved in the accident, try to get it to the side of the road.
 - If you're stopping to help, park away from the accident. The area immediately around the accident will be needed for emergency vehicles.
 - Put on your flashers.
 - Set out reflective triangles to warn other traffic.

ACCIDENT PROCEDURES

- If you have a cell phone or CB, call for assistance before you get out of your vehicle.
- If a qualified person is at the accident and helping the injured, stay out of the way unless asked to assist. Otherwise, do the best you can to help any injured parties.
- Some simple steps to follow in giving assistance:
 - Don't move a severely injured person unless the danger of fire or passing traffic makes it necessary.
 - Stop heavy bleeding by applying direct pressure to the wound.
 - Keep the injured person warm.

FIRES

- The following are some causes of vehicle fires:
 - **After Accidents.** Spilled fuel, improper use of flares.
 - **Tires.** Under-inflated tires and duals that touch.
 - **Electrical System.** Short circuits due to damaged insulation, loose connections.
 - **Fuel.** Driver smoking, improper fueling, loose fuel connections.
 - **Cargo.** Flammable cargo, improperly sealed or loaded cargo, poor ventilation.

FIRES

- Pay attention to the following:
 - **Vehicle Inspection.** Make a complete inspection of the electrical, fuel, and exhaust systems, tires, and cargo. Be sure to check that the fire extinguisher is charged.
 - **En Route Inspection.** Check the tires, wheels, and truck body for signs of heat
 - **Follow Safe Procedures.** Follow correct safety procedures for fueling the vehicle, using brakes, handling flares, and other activities that can cause a fire.
 - **Monitoring.** Check the instruments and gauges often for signs of overheating and use the mirrors to look for signs of smoke from tires or the vehicle.

FIRE FIGHTING

- The first step is to get the vehicle off the road and stop. Park in an open area, away from buildings, trees, brush, other vehicles, or anything that might catch fire.
- Before trying to put out the fire, make sure that it doesn't spread any further.
 - With an engine fire, turn off the engine as soon as you can. Don't open the hood if you can avoid it. Shoot foam through louvers, radiator, or from the vehicle's underside.
 - For a cargo fire in a van or box trailer, keep the doors shut, especially if your cargo contains hazardous materials.

FIRE FIGHTING

- Extinguish the fire
 - Stay as far away from the fire as possible.
 - Aim at the source or base of the fire, not up in the flames.
- Use the right fire extinguisher.
 - Water can be used on wood, paper, or cloth, but not on electrical or gasoline fire
 - A burning tire must be cooled. Lots of water may be required
 - If unsure what to use, especially on hazardous materials, wait for firefighters
 - Position yourself upwind.
 - Continue until whatever was burning has been cooled.
 - Absence of smoke or flame does not mean the fire cannot restart.



ALCOHOL, OTHER DRUGS

- Drinking alcohol and driving is very dangerous and a serious problem.
- Alcohol impairs muscle coordination, reaction time, depth perception, and night vision.
- It also affects the parts of the brain that control judgment and inhibition.
- Alcohol goes directly into the blood stream and is carried to the brain.



ALCOHOL, OTHER DRUGS

- The liver can only process one-third an ounce of alcohol per hour.
- Only time, not black coffee or a cold shower, will sober you up.
- If you have drinks faster than your body can get rid of them, you will have more alcohol in your body, and your driving will be more affected.
- All of the following drinks contain the same amount of alcohol:
 - A 12-ounce glass of 5% beer.
 - A 5-ounce glass of 12% wine.
 - A 1 1/2-ounce shot of 80 proof liquor.

BLOOD ALCOHOL CONCENTRATION (BAC)

- BAC is determined by:
 - The amount of alcohol you drink ,
 - how fast you drink ,
 - and your weight
- The first part of the brain affected controls judgment and self-control. Which are absolutely necessary for safe driving
- As BAC continues to build up, muscle control, vision, and coordination are affected more and more.
- Effects on driving may include:
 - Straddling lanes.
 - Quick, jerky starts.
 - Not signaling, failure to use lights.
 - Running stop signs and red lights.
 - Improper passing.
 - These effects mean increased chances of a crash and chances of losing your driver's license.

ALCOHOL, OTHER DRUGS

- All drivers are affected by drinking alcohol.
- It causes serious driving errors, such as:
 - Increased reaction time to hazards.
 - Driving too fast or too slow.
 - Driving in the wrong lane.
 - Running over the curb.
 - Weaving.

ALCOHOL, OTHER DRUGS

- Laws prohibit possession or use of many drugs while on duty.
- They prohibit being under the influence of any "controlled substance," amphetamines (including "pep pills," "uppers," and "bennies"), narcotics, or any other substance, which can make the driver unsafe.
- This could include a variety of prescription and over-the-counter drugs (cold medicines), which may make the driver drowsy or otherwise affect safe driving ability.
- Possession and use of a drug given to a driver by a doctor is permitted if the doctor informs the driver that it will not affect safe driving ability.

ALCOHOL, OTHER DRUGS

- Pay attention to warning labels for legitimate drugs and medicines, and to doctor's orders regarding possible effects.
- Stay away from illegal drugs. Don't use any drug that hides fatigue--the only cure for fatigue is rest.
- Alcohol can make the effects of other drugs much worse. **The safest rule is don't mix drugs with driving at all.**
- Use of drugs can lead to:
 - Traffic accidents resulting in death, injury, and property damage.
 - It can lead to arrest, fines, and jail sentences. It can also mean the end of a person's driving career.
- Do not drive if so ill you cannot operate a motor vehicle safely.

HAZARDOUS MATERIALS

- All drivers should know something about hazardous materials.
 - Be able to recognize hazardous cargo,
 - Know whether or not you can haul it without having a hazardous materials endorsement on your CDL license.

Hazard Class Definitions		
Class	Class Name	Example
1	Explosives	Ammunition, Dynamite, Fireworks
2	Gases	Propane, Oxygen, Helium
3	Flammable	Gasoline Fuel, Acetone
4	Flammable Solids	Matches, Fuses
5	Oxidizers	Ammonium Nitrate, Hydrogen Peroxide
6	Poisons	Pesticides, Arsenic
7	Radioactive	Uranium, Plutonium
8	Corrosives	Hydrochloric Acid, Battery Acid
9	Miscellaneous Hazardous Materials	Formaldehyde, Asbestos
None	ORM-D (Other Regulated Material-Domestic)	Hair Spray or Charcoal
None	Combustible Liquids	Fuel Oils, Lighter Fluid

HAZARDOUS MATERIALS

- Hazardous materials are products that pose a risk to health, safety, and property during transportation
- Intent of rules about transporting hazardous materials
 - Contain the product
 - Communicate the risk
 - Ensure safe drivers and equipment

HAZARDOUS MATERIALS

- Containment rules:
 - Tell shippers how to package safely
 - Tell drivers how to load, transport, and unload bulk tanks
- Communicate the risk
 - The shipper uses a shipping paper and diamond shaped hazard labels
 - Shipping papers must be kept:
 - In a pouch on the driver's door, or
 - In clear view within reach while driving, or
 - On the driver's seat when out of the vehicle

HAZARDOUS MATERIALS

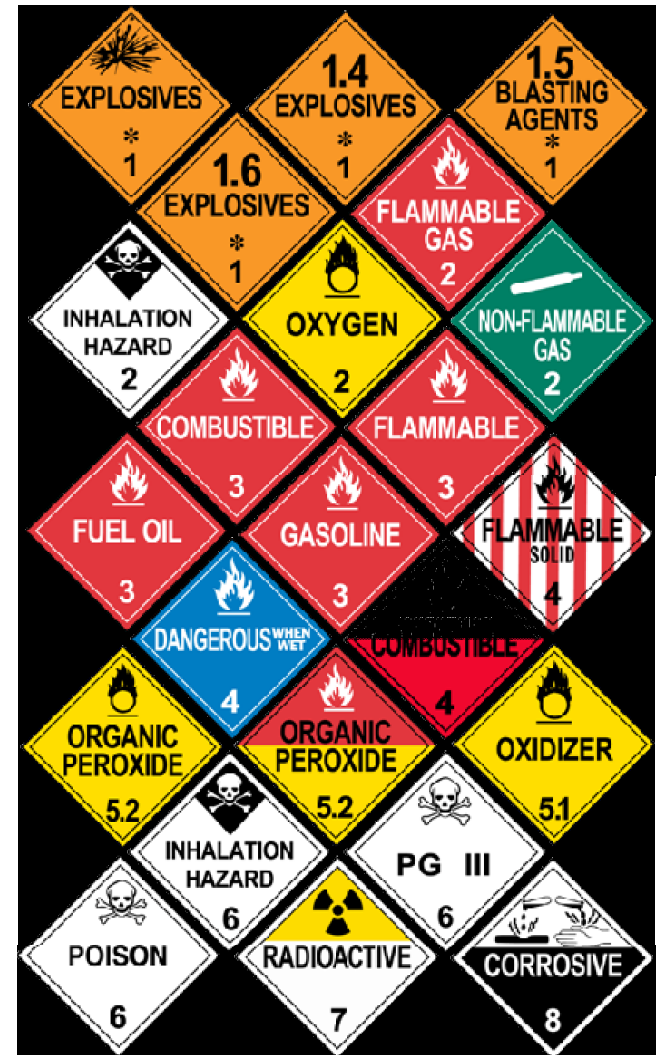
- Placards are used to warn others of hazardous materials
 - Outside of the vehicle
 - Must have a least four
 - On the front, rear, and both sides
 - Must be readable from all four directions
 - At least 10 $\frac{3}{4}$ inches square, turned upright on a point, in a diamond shape
 - Cargo tanks and other bulk packaging display the identification number of their contents on placards or orange panels

HAZARDOUS MATERIALS

- Identification numbers are a four digit code used by first responders to identify hazardous materials
 - May be used to identify more than one chemical on shipping papers
 - Will be preceded by the letters "NA" or "UN"
- Not all vehicles carrying hazardous materials need to have placards.
 - You can drive a vehicle that carries hazardous materials if it does not require placards.

HAZARDOUS MATERIALS

- Never drive a vehicle needing placards unless you have the hazardous materials endorsement.
- To do so is a crime
- When stopped, you will be cited and not allowed to drive your truck
- It will cost you time and money
- A failure to placard when needed may risk your life and others if you have an accident



SECTION 3 TRANSPORTING CARGO SAFELY

- Items covered
 - Inspecting cargo
 - Cargo Weight and Balance
 - Securing Cargo
 - Cargo Needing Special Attention
- You are responsible for:
 - Inspecting cargo
 - Recognizing overloads and poorly balanced weight
 - Knowing cargo is properly secured and does not obscure your view ahead or to the sides
 - Knowing cargo does not restrict access to emergency equipment



INSPECTING CARGO

- Make sure truck is not overloaded and cargo is balanced and secured properly
- Inspect within the first 50 miles after beginning a trip
- After driving for 3 hours or 150 miles
- After every break you take during driving



LEGAL WEIGHT LIMITS

- Keep weights within legal limits.
- States have maximums for GVWRs, GCWRs, and axle weights.
- Often, maximum axle weights are set by a bridge formula.
 - A bridge formula permits less axle weight for axles that are closer together to prevent overloading bridges and roadways.
- Overloaded trucks have to go very slowly on upgrades. Worse, they may gain too much speed on downgrades. Stopping distance increases.

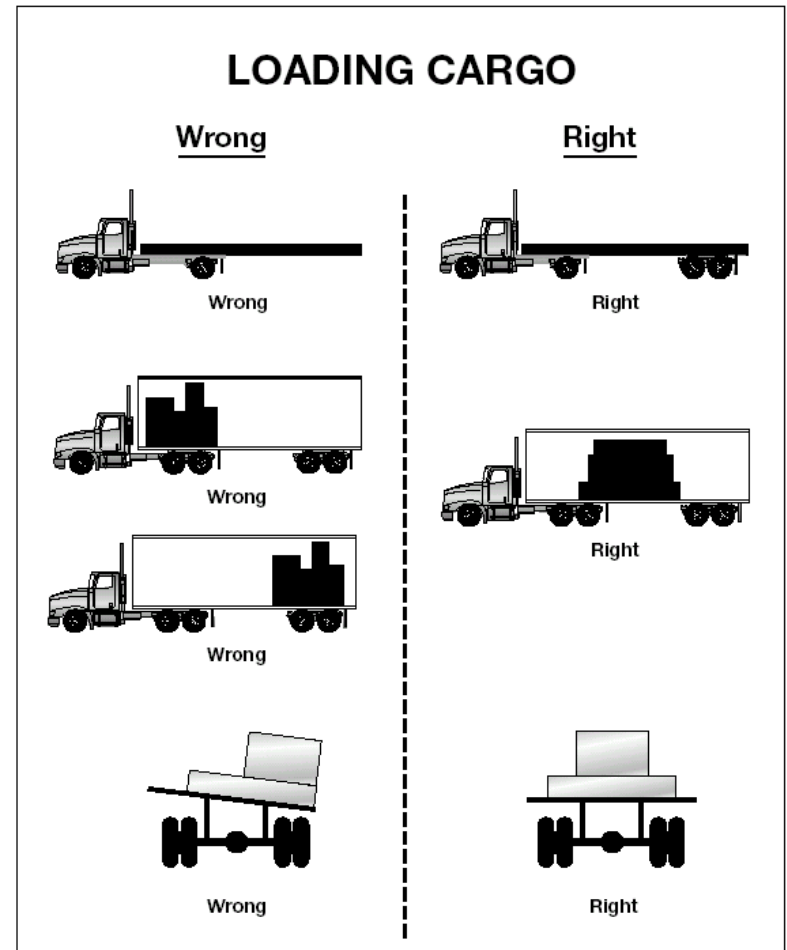
WEIGHT

- A high center of gravity means you are more likely to tip over.
 - It is most dangerous in curves, or
 - If you have to swerve to avoid a hazard
- Distribute the cargo so it is as low as possible
- Put heaviest parts under the lightest parts.



BALANCE THE WEIGHT

- Poor weight balance can make vehicle handling unsafe.
- Too much weight on the steering axle
 - Hard steering.
 - Damage the steering axle and tires.
- Under-loaded front axles
 - Make the steering axle weight too light to steer safely.
- Too little weight on the driving axles
 - Poor traction.
 - Drive wheels may spin easily.
 - During bad weather, the truck may not be able to keep going.

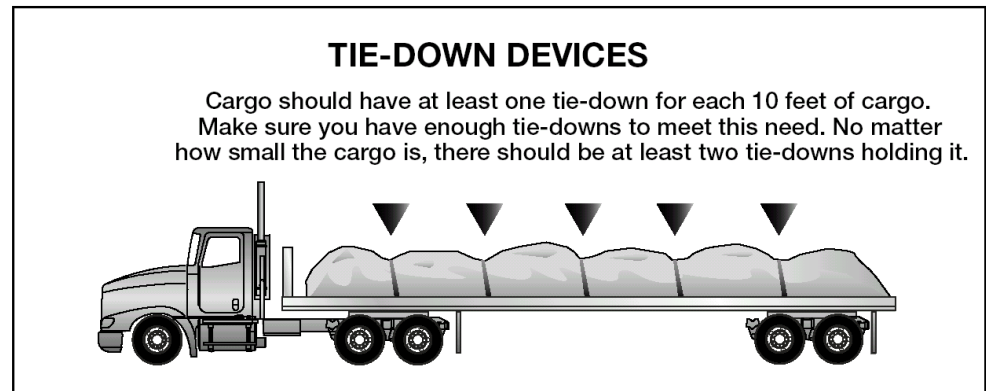


SECURING CARGO

- Blocking
 - Used in front, back, and/or sides to keep cargo from sliding
 - Shaped to fit snugly against cargo
 - Secured to the cargo deck
- Bracing
 - Prevent movement of cargo
 - Upper part of cargo to the floor and/or walls

SECURING CARGO

- Tie-down
 - Flatbed trailers or trailers without sides
 - Keeps cargo from shifting or falling off
 - Must be at least one-half times the weight of the article or group of articles
 - Proper equipment
 - Ropes
 - Straps
 - Chains
 - Tensioning devices
 - Attached correctly
 - One tie-down for each ten foot of cargo
 - Minimum of two tie-downs, no matter the size of the load



SECURING CARGO

- Header boards
 - Front-end (“headache racks”)
 - Blocks forward movement of cargo
- Covering cargo
 - To protect people from spilled cargo
 - To protect the cargo from weather
- Sealed and Containerized Loads
 - Containerized loads are used when freight is carried part way by rail or ship
 - Cannot inspect sealed loads but check that you don’t exceed gross weight and axle weight limits

SPECIAL ATTENTION NEEDED

- Dry bulk
 - High center of gravity
 - Extreme caution around curves and sharp turns
- Hanging Meat (suspended beef, pork, lamb)
 - Refrigerated truck
 - Can be unstable because of a high center of gravity
 - Caution on sharp curves such as on and off ramps. Go slowly
- Livestock
 - Can move around
 - Shifts the center of gravity and makes rollover more likely
- Oversized Load
 - Over-length, over-width, and/or overweight loads
 - Special transit permit required
 - Driving limited to certain times
 - Special equipment may be necessary

SECTION 4

TRANSPORTING PASSENGERS SAFELY

■ Remember:

- This section is not referencing a school bus
- There are differences between a school bus and other buses
- Keep the two sections separated in your mind for testing



ITEMS COVERED IN THIS SECTION

- Vehicle Inspection
- Loading
- On the road
- After-trip Vehicle Inspection
- Prohibited Practices
- Use of Brake-door Interlocks

NOTE: This endorsement is required to drive a vehicle designed to seat 16 or more including the driver

VEHICLE INSPECTION

- Before driving, review previous drivers inspection report-Do not sign it unless defects are certified as repaired or not needed to be repaired
- Make sure these things are in good working order before driving:
 - Service Brakes – Check couplings if the bus has a trailer
 - Parking Brake
 - Steering mechanism
 - All lights and reflectors
 - Tires – No recaps on front wheels
 - Horn

VEHICLE INSPECTION (CONT.)

- Windshield wipers
- Rear-vision mirror
- Coupling devices if applicable
- Emergency equipment – Extinguisher, reflectors, and fuses if equipped
- Wheels and rims
- Access doors and panels
 - All doors/panels closed
- Close any open emergency exits



BUS INTERIOR

- Check the following for damage and safety:

Check that the aisles and stairwells are clear. No folding seats in aisle

Handholds and railings

Check and signaling devices and restroom emergency buzzer if equipped

Emergency exit handles/buzzers

All seats secure



BUS INTERIOR (CONT.)

Never drive with an emergency exit open

Roof hatch may be locked open for fresh air but watch for clearance

“Emergency Exit” sign must be clearly visible and red emergency door light must work if equipped.

Driver should always wear a seatbelt



LOADING AND TRIP START

- Keep doorway and aisle clear
- Secure all baggage to:
 - Allow the driver to move freely
 - Permit access to emergency exits
 - Prevent injury if anything shifts



LOADING AND TRIP START (CONT.)

- Watch for hazardous materials-Most cannot be carried. Do not transport them unless rules allow it
- Nine different four-inch, diamond shaped hazard labels to watch for include:

Nine Classes of Hazardous Materials

Class 1: Explosives Divisions: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6	Class 2: Gases Divisions: 2.1, 2.2, 2.3	Class 3: Flammable Liquid and Combustible Liquid	Class 4: Flammable Solid, Spontaneously Combustible, and Dangerous When Wet Divisions 4.1, 4.2, 4.3	Class 5: Oxidizer and Organic Peroxide Divisions 5.1, 5.2
				
Class 6: Poison (Toxic) and Poison Inhalation Hazard	Class 7: Radioactive	Class 8: Corrosive	Class 9: Miscellaneous	Dangerous

Federal Motor Carrier Safety Administration

U.S. Department of Transportation
www.fmcsa.dot.gov

Revised 06/05

Watch for riders with unlabeled hazardous materials as well

LOADING AND TRIP START (CONT.)

- Buses may carry:
 - Small-arms ammunition labeled ORM-D, emergency hospital supplies, and drugs
 - Small amounts of other materials that the shipper cannot send any other way
- Buses must never carry:
 - Division 2.3 poison gas, liquid class 6 poison, tear gas or irritating material. Not more than 100lbs. Class 6
 - Explosives in the space occupied by people except small-arms ammunition
 - Radioactive in the space occupied by people
 - Not more than 500 lbs. total or 100 lbs. of any one class
 - Do not allow common hazards such as car batteries or gasoline

LOADING AND TRIP START

- Standing passengers are allowed
 - Passengers must stay behind 2" standee line
- At your destination, announce:
 - Location
 - Reason for stopping
 - Departure time and bus number
 - Remind them to take carry-on before stopping
 - Charter drivers should not allow riders on the bus until departure time

ON THE ROAD

- Passenger supervision
 - Explain rules on smoking, drinking, and music
 - Scan the interior as well as the road ahead, to the sides, and to the rear
 - Passengers must keep arms and head inside the bus
- At stops
 - Make smooth stops to avoid injury
 - Caution riders to watch their step
 - Wait for them to sit down or brace themselves before starting to move
- Drunk or disruptive rider may be discharged in a safe place-Many carriers have guidelines

ON THE ROAD (CONT.)

- Most common accidents:
 - Often at intersections-Use extra caution
 - Avoid traveling next to others when possible
 - When pulling out of bus stops-Especially watch mirrors
 - Know the clearance your bus needs
 - Know the gap you need to accelerate into traffic
 - Wait for the gap to open before leaving the stop
 - Never assume other drivers will brake and let you in
 - Watch for hazards-Anyone or anything that is unsafe
- Speed on curves – Slow before a curve and accelerate out
 - Posted speed may be safe for cars but not for a bus
 - Bus may roll over or slide
 - Reduce speed for curves! If the bus leans, you are going too fast

ON THE ROAD (RR CROSSINGS)

- Railroad Crossings-Stop 15-50 feet
 - Open door, listen, and look
 - After a train, look for another one
 - If manual transmission, never change gears while crossing a track

Your bus will come out on the losing end of a collision with a train every time



ON THE ROAD (RR CROSSINGS)

- You are not required to stop when:
 - You are at a streetcar crossing
 - A policeman or flagman is directing traffic
 - If a traffic signal is green
 - At crossings marked as “exempt” or “abandoned”



ON THE ROAD (DRAWBRIDGES)

- Stop at drawbridges without a signal or attendant
 - Stop 50' from the draw-make sure it is safe and completely closed before crossing
- You are not required to stop when:
 - There is a light showing green
 - An attendant or traffic officer who controls traffic when the bridge opens

Don't let this be you



AFTER-TRIP VEHICLE INSPECTION

- Inspect your bus after each shift
 - Report mandatory for interstate carriers
 - Must specify each bus and any safety defects
 - Check interior for damage caused by passengers-
Handholds, seats, emergency exits, and windows
 - Check and repair brake interlocks on transit buses
 - Signaling devices that should be checked/repared

PROHIBITED PRACTICES

- Avoid fueling with passengers on board
 - Never fuel indoors with passengers on board
- Don't talk to riders or engage in distracting activity while driving
- Do not tow or push a bus with riders on board unless it is unsafe for them to get off first
- Never use the brake door interlock in place of a parking brake

SECTION 5

AIR BRAKES

- **Air brakes use compressed air to apply brakes**
 - A good and safe way to stop large heavy vehicles
 - Must be well maintained and used properly as covered in this section
- **Topics covered in this section**
 - Air brake system parts
 - Dual air brake systems
 - Inspecting air brakes
 - Using air brakes

AIR BRAKE SYSTEM PARTS

- Air brakes are really three systems
 - **Service Brake** – Applies and releases brakes when you step on the brake pedal during normal driving

Foot on pedal = Service brake



- **Parking brake** – Held back by air and is released when you pull the parking brake control

Button pulled out = Parking brake



- **Emergency Brake** – Held back by air
 - Comes on automatically
 - Stops the vehicle in case of a brake failure
 - Detailed description provided in later slide

AIR COMPRESSOR

- **Air Compressor** – Pumps air into storage tanks
 - Connected through gears or a belt (as shown below)
 - May be air cooled or cooled by the engine
 - May have its own oil supply or use engine oil (check it before driving)
- Typical belt driven air compressor shown



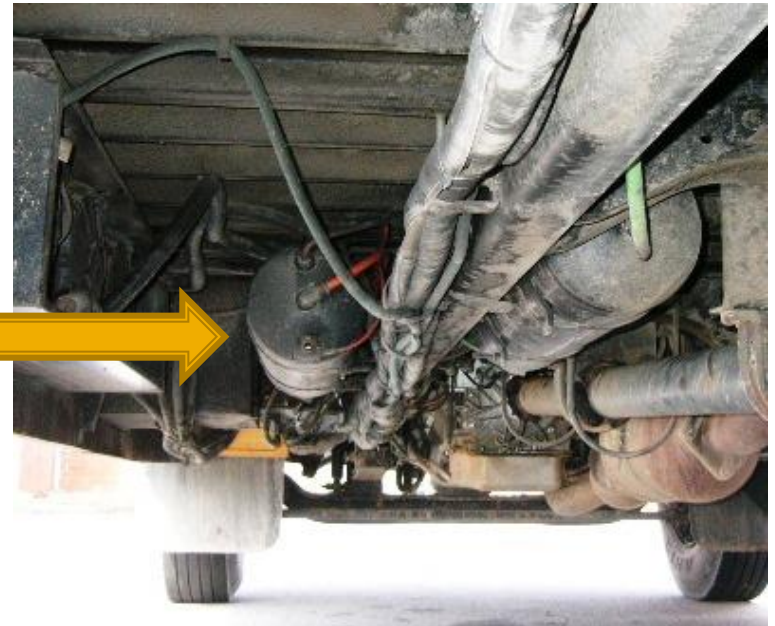
AIR COMPRESSOR GOVERNOR

- **Air compressor governor** – Controls when the compressor will pump air into the tanks
 - Stops pumping at “cut-out” around 125 psi
 - Starts pumping at “cut-in” pressure around 100 psi
- Typical air compressor governor shown



AIR STORAGE TANKS

- **Air Storage Tanks** – Used to hold compressed air
 - Size and number vary
 - Hold enough air to allow several stops even if the compressor fails
- Typical school bus dual air tanks shown



AIR TANK DRAINS AND DRYER

- **Air tank drains** – Manual and automatic types

- Compressed air usually has some water and some compressor oil in it which is bad for the air brake system.

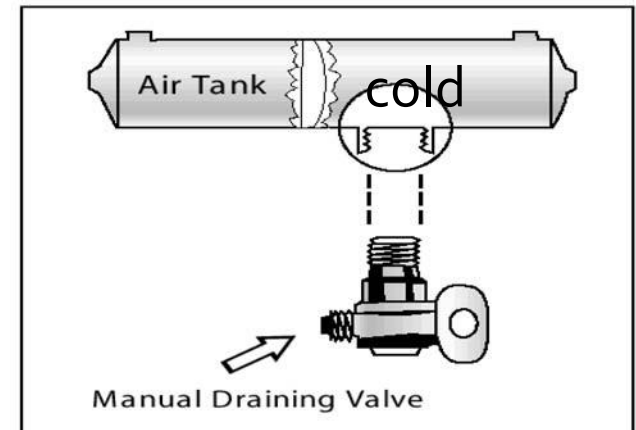
For example, the water can freeze in weather and cause brake failure.

The water and oil tend to collect in the bottom of the air tank.

- Be sure that you drain the air tanks completely.

- Two types:

- Manually – you must drain the tanks yourself at the end of each day of driving by turning a quarter turn or pulling a cable
- Automatic – water and oil are automatically expelled. These are available with electric heating devices which help prevent freezing

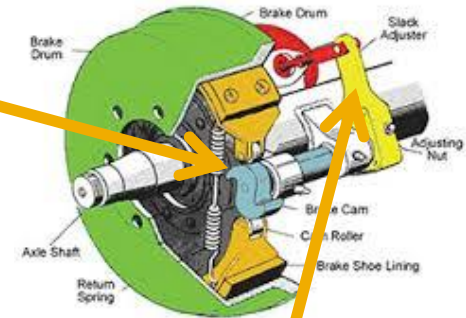


OTHER AIR BRAKE COMPONENTS

- **Alcohol evaporator** – Installed on some systems
 - Helps reduce the risk of ice in the air brakes. Ice can make the brakes stop working
 - Check the level daily in cold weather
- **Safety valve** – Protects the tank and system from too much pressure
 - Usually set to release air at 150 psi
 - If it releases air, have a mechanic check it
- **Brake pedal** – Pushing the pedal applies the brakes
 - Each time you depress and release it, air pressure is used
 - Avoid pressing and releasing the brakes unnecessarily since a loss of air pressure could cause the brakes not to work

FOUNDATION BRAKES

- **Foundation brakes** – Used at each wheel
 - Most common is the s-cam drum brake (shown below)
- **Brake drums, shoes, and linings**
 - Located on the end of each axle
 - Shoes and linings push against the drum
 - When used, brakes get hot and too much heat can cause brakes to fail (fade)
- Pushing the brake pedal moves the slack adjuster which rotates the s-cam – the twisting cam causes friction against the drum. S-cam forces the shoes away from each other and presses them against brake drum

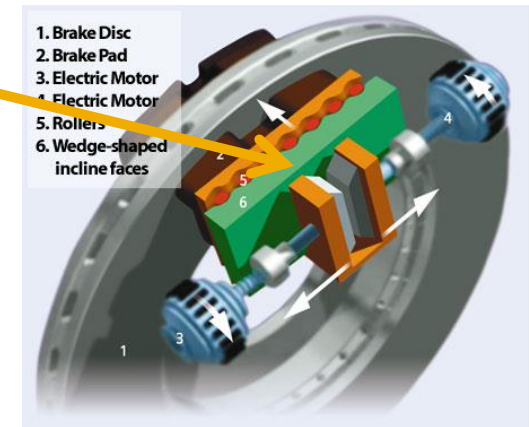


WEDGE AND DISK BRAKES

- **Wedge Brakes** – Wedge pushes against two shoes

- May have one chamber or two
- May be manual or self-adjusting

Sample wedge brake



- **Disk Brakes** – Instead of an s-cam, air pressure moves the “power screw” to clamp the brake

Typical disk brake



SPRING BRAKES APPLY FULLY AT 20-45 PSI

- A low air pressure warning is required by 60 psi (large buses, 80-85 psi)
 - Stop immediately if it comes on (light and/or buzzer)
 - Other vehicles may have a mechanical “wig wag” device
- Properly adjusted spring brakes will apply fully when the brake pressure drops to 20-45 psi (typically 20-30)
- Failure to stop immediately when the low air warning comes on will cause the brakes to apply suddenly
- Don't let this happen to you



STOP LIGHT SWITCH AND LIMITING VALVE

■ Stop light switch

- Turns on brake lights when you depress the brake

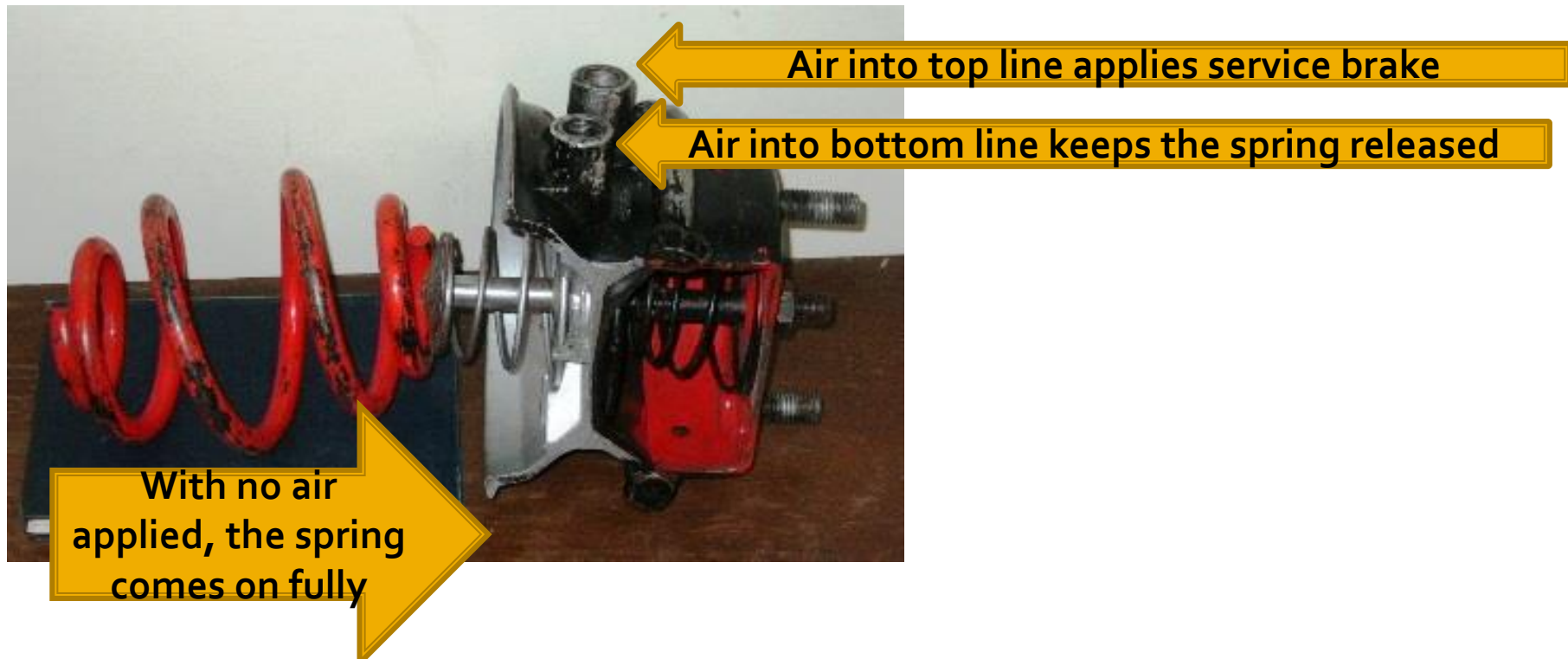
■ Front brake limiting valve

- Vehicles before 1975 have a manual valve in the cab
- Usually marked “normal” or “slippery”
- Keep it in the “normal” position for best braking
- Some vehicles have automatic limiting valves which reduce front brake pressure except when braking hard

SPRING BRAKES

- Parking and emergency brakes use mechanical brakes to apply – typically springs as shown below:

Typical rear brake chamber open to view spring brake



SPRING BRAKES

- When driving, the springs are held back by air pressure
- A parking brake control allows the driver to let air out of the spring brakes
- Tractor and straight truck spring brakes come fully on when air pressure drops to a range of 20 to 45psi
- Braking power depends on brakes being in adjustment

PARKING BRAKE CONTROLS

- Parking brake controls
 - Newer vehicles use a yellow diamond-shaped button; pull to apply and push to release
 - Use parking brake whenever parked
 - Never push the service brake when the spring brake is applied since it could cause damage
- Modulating control valve
 - Not on all vehicles
 - Allows gradual application of the spring brake
 - More you move lever the harder spring brakes apply, which allows the driver to control the spring brakes if service brakes fail
- Dual parking control valve
 - Controls a separate tank on some vehicles
 - Used to move the vehicle in an emergency



ANTILOCK BRAKING SYSTEMS (ABS)

- ABS keeps wheels from locking during hard braking
 - Only activates to prevent wheels from locking up
 - Helps to maintain control
- Antilock brakes are required on:
 - Truck tractors built on or after March 1, 1997
 - All other air brake vehicles after March 1, 1998
- Malfunctions indicated by a yellow warning lamp
 - Required lamp on the instrument panel
 - Trailers have a lamp on the left side –front or rear corner
 - Newer systems – Light flashes on briefly
 - Older systems – Light may stay on until 5 mph
 - Systems before 1998 may have no light – Look under vehicle for an electronic control unit (ECU)

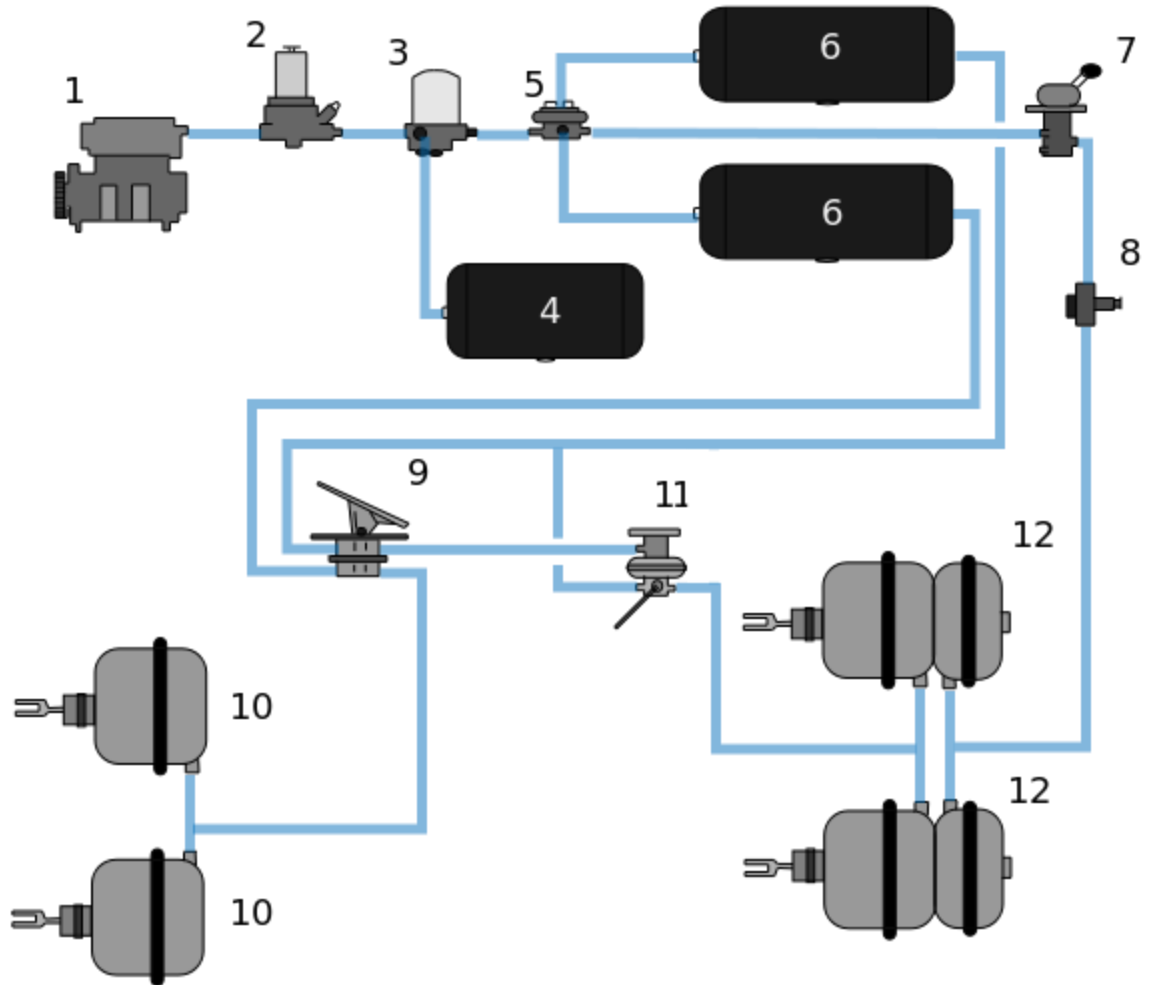


DUAL AIR BRAKE SYSTEMS

- Used on most heavy vehicles
 - Two systems – Front and Rear axle – Simple example shown on next slide
 - One set of controls – Separate tanks, hoses, lines. etc.
- Before driving, build pressure to 100 psi in both systems
 - Low air pressure warning shuts off at above 60 psi
- Remember – If the low air warning comes on, stop the vehicle immediately and have system fixed
- If one air system is very low on pressure, either the front or rear brakes will not be operating fully

SIMPLE AIR BRAKE SYSTEM DIAGRAM

1. Air compressor
2. Governor
3. Air dryer
4. Regeneration reservoir
5. Protection valve
6. Air tanks
7. Hand control valve
8. Park brake valve
9. Foot valve
10. Front air brake chambers
11. Brake relay valve + load sensing valve
12. Rear spring brake chambers



INSPECTING AIR BRAKES

- Engine compartment
 - Check tightness of compressor drive belt
- During walk-around
 - Check slack adjusters for less than one inch play
 - On level ground, chock vehicle and release parking brake to check manual slack adjusters
 - Brakes out of adjustment are the most common problem found in roadside inspections
 - All vehicles since 1994 have automatic slack adjusters
 - Normally do not require adjustment except when installed
 - If found out of adjustment, have problem corrected ASAP
 - Adjust manually only in an emergency – This will not correct the problem for long and they will soon go out of adjustment

INSPECTING AIR BRAKES (CONT.)

- Check brake drums (or disks), linings, and hoses
 - Drums/discs – No cracks longer than $\frac{1}{2}$ friction area
 - Linings – Not loose or soaked with oil/grease
 - Not worn thin
 - Hoses not cut or worn



INSPECTING AIR BRAKES (CONT.)

- Final air brake check
- Test low air pressure warning signal
 - Shut engine off when air pressure is high enough that the low pressure warning is not on
 - Turn key on and step on and off the brake pedal (fanning) to reduce the air tank pressure
 - The low air pressure warning signal must come on before the pressure drops to less than 60 psi in the air tank
 - If it doesn't work this could cause loss of air pressure without your knowledge which could cause emergency braking in a single circuit system and stopping distance increased in dual systems

INSPECTING AIR BRAKES (CONT.)

- Check that spring brakes come on automatically
 - Continue to fan off the air pressure
 - The tractor protection valve and parking brake valve should close (pop out) on a tractor-trailer combination and the parking brake valve should close (pop out) on other combination and single vehicle when air pressure falls to the manufacturers specification (20 – 45 psi)
- Check rate of pressure buildup
 - When engine is at operating rpms, the pressure should build from 85 to 100 psi within 45 seconds in a dual system (check manufacturers specifications)
 - In single systems build-up from 50 to 90 psi within 3 minutes with the engine at an idle speed of 600 – 900 rpms
 - If air pressure does not build up fast enough, your pressure may drop too low during driving, requiring an emergency stop. Don't drive until problem fixed.

INSPECTING AIR BRAKES (CONT.)

- Test air leakage rate with a fully-charged air system (typically 125)
 - Turn off the engine
 - Release the parking brake (push in)
 - Time the air pressure drop (Note: brake is not on)
 - The loss rate should be less than 2 psi in one minute for single vehicles
 - The loss rate should be less than 3 psi in one minute for combination vehicles

INSPECTING AIR BRAKES (CONT.)

- Test air leakage rate with a fully-charged air system (typically 125)
 - Turn off the engine
 - Chock the wheels
 - Release the parking brake (all vehicles) and the tractor protection valve (combination vehicle)
 - Fully apply the foot brake
 - Hold the foot brake for 1 minute (Note: brake is on)
 - The loss rate should be less than 3 psi in one minute for single vehicles
 - The loss rate should be less than 4 psi in one minute for combination vehicles
- If air pressure is more than listed on the last two slides:
 - Check for air leaks
 - Fix before driving
 - If not fix, could lose your brakes while driving

INSPECTING AIR BRAKES (CONT.)

- Check air compressor governor cut-in and cut-out pressure
- Pumping by the air compressor should start at about 100 psi and stop at about 125 psi
 - Run the engine at fast idle
 - The governor should cut-out about 125 psi and gauge will stop rising
 - With engine idling
 - Step on and off the brake to reduce the air tank pressure
 - Governor should cut-in about 100 psi
- If it does not work as described
 - It may need to be fixed
 - A governor that does not work properly may not keep enough air pressure for safe driving

BRAKE CHECKS

PARKING AND SERVICE BRAKE CHECKS



Parking Brake Test: With the engine running and the parking brake set, shift to drive and accelerate lightly. The bus should not move. On combination vehicles, the trailer brakes should be released.

Service Brake Test: Release the parking brake and move forward slowly (5 MPH). When stopping, there should be no pulling to one side.



USING AIR BRAKES

- Normal stops
 - Steady pressure for a smooth stop
 - With a manual transmission, don't push the clutch until close to idle
- Braking with antilock brakes
 - Antilock brakes prevent lock up
 - Maintains steering control on slippery surfaces
 - If you have ABS on the tractor only
 - Keep an eye on the trailer and let up on brakes if it swings out / Jackknife
 - If you have ABS on the trailer only
 - The trailer is less likely to swing out
 - If ABS fails, you still have normal brake function- Get it serviced ASAP



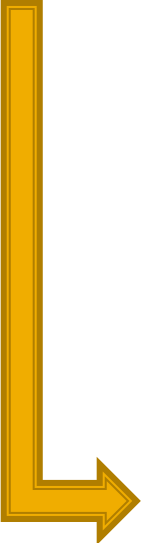
Jackknifed Trailer

USING AIR BRAKES (CONT.)

- Emergency stops – brake to keep vehicle straight and allow to turn if necessary
 - Controlled braking – Apply hard without locking
 - Keep steering wheel movements small
 - If wheels lock, release brakes
 - Stab Braking-Apply hard and lock wheels
 - Release when wheels lock up
 - As soon as the wheels start rolling, apply brakes fully

STOPPING DISTANCE

- Stopping Distance = Perception distance + reaction distance + brake lag (1/2 second) + braking distance
 - Total stopping distance with good traction at 55 mph is over 450 feet as shown below



15	81'	39'	16'	9'	17'		
25	155' Total Stop Dist.				47'		
35	243' Total Stopping Distance				92'		
45	346' Total Stopping Distance				152'		
55	451' Total Stopping Distance				216'		
MPH	Perception Distance		Reaction Distance	Brake Lag	Braking Distance		

NOTE: Brake lag is the reason air brakes take longer to stop than hydraulic brakes – time required for brakes to work after pedal is pushed. Takes time for air to flow through the lines to the brakes

BRAKE FADING OR FAILURE

- Brake fade
 - Rely on engine braking to prevent brake fade
 - Braking causes heat and excess heat causes fade
 - Continued overuse may increase fade enough so that you are unable to stop the vehicle
 - Power may be affected by brake adjustment
 - Causes brake drums to expand



Proper braking technique could have prevented this situation
(see next slide)

PROPER BRAKING TECHNIQUE

- Most important point is that brakes supplement the effect of the engine in the proper low gear
- Proper hill technique when in proper low gear at top of hill:
 1. Apply the brakes to feel a slowdown (about 5 mph)
 2. Release the brakes fully at 5 mph below safe speed
 3. When your speed increases to your safe speed, repeat steps 1 & 2 above



LOW AIR PRESSURE

- Low air pressure warning
 - If it comes on, stop immediately
 - You only remain in control until pressure reaches 20-45 psi – At that point, spring brakes will fully apply
 - If you don't stop
 - Heavy vehicles may take a long time to stop
 - Light vehicles (like a school bus) may skid out of control
- Remember – It is much easier and safer to stop while there is enough air in the tank to use the foot brake

PARKING BRAKE

- Pull the yellow diamond shaped button to park
 - Older vehicles may have a blue knob or lever
- Times you should not use the parking brake:
 - When the brakes are very hot – Use chocks to cool
 - In freezing temperatures when wet – Use lightly while driving to heat and dry them
- Drain tanks at the end of each day
 - In a school bus, drain your tanks any time you are out of sight of the bus



NOTE: Never leave your vehicle unattended without applying the parking brakes or chocking the wheels. The vehicle may roll away and cause injury and damage

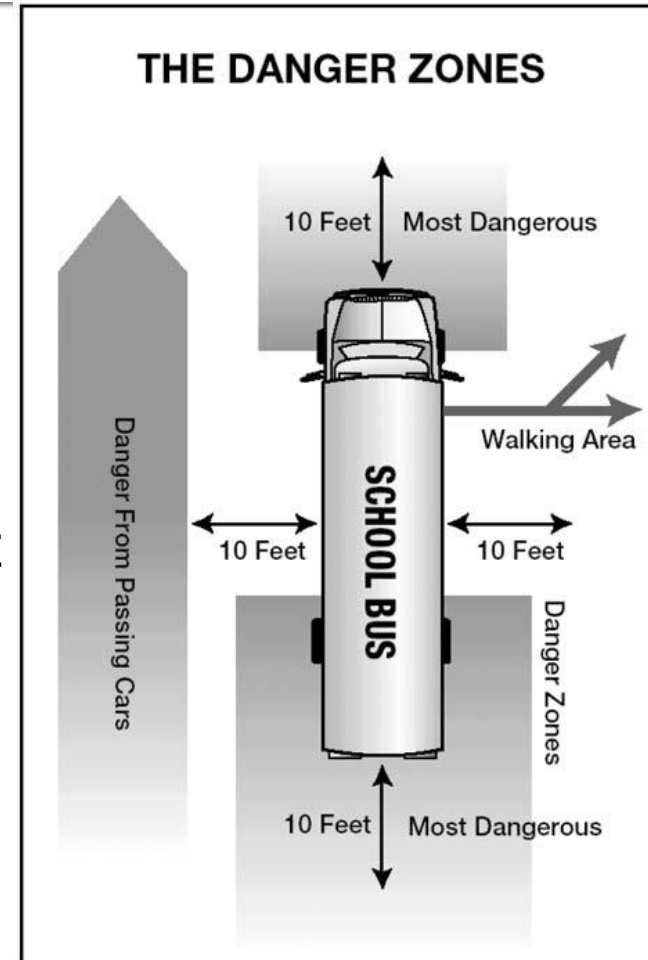
SECTION 10

SCHOOL BUS


- This section covers
 - Danger zones and mirrors
 - Loading and unloading
 - Emergency exit and evacuation
 - Railroad-highway grade crossing
 - Student management
 - Antilock braking systems
 - Special safety considerations

DANGER ZONES AND USE OF MIRRORS

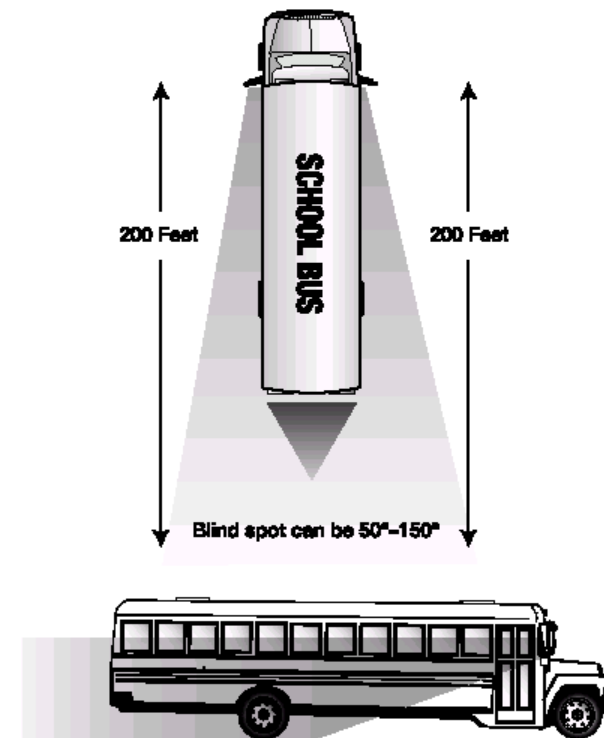
- Areas where children are in danger
 - Danger from passing cars – especially on the left side
 - Danger from being hit by their own bus- Especially in the front
- Most dangerous is the first 10 feet as shown but it may extend to up to 30 feet
- Proper adjustment and use of all mirrors is vital to safe operation
 - Always adjust mirrors before use
 - Check for students, traffic, and other objects in the danger zones



OUTSIDE LEFT AND RIGHT FLAT MIRRORS

- Mounted on front left/right corners
 - Used to monitor traffic, check clearances, and students – Side & rear
 - Note that the blind spot is 50-150 feet
 - Could be up to 400 feet on some buses
- When properly adjusted, should:
 - Show 200' or 4 bus lengths behind
 - Along the sides of the bus
 - The rear tires touching the ground
 - Correct adjustment shown 

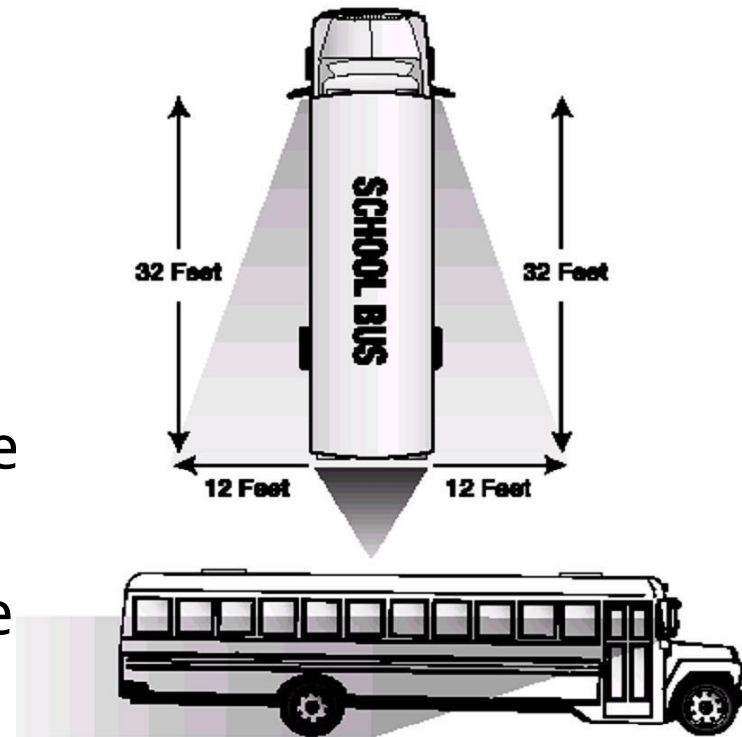
LEFT AND RIGHT SIDE FLAT MIRRORS



OUTSIDE LEFT AND RIGHT SIDE CONVEX MIRRORS

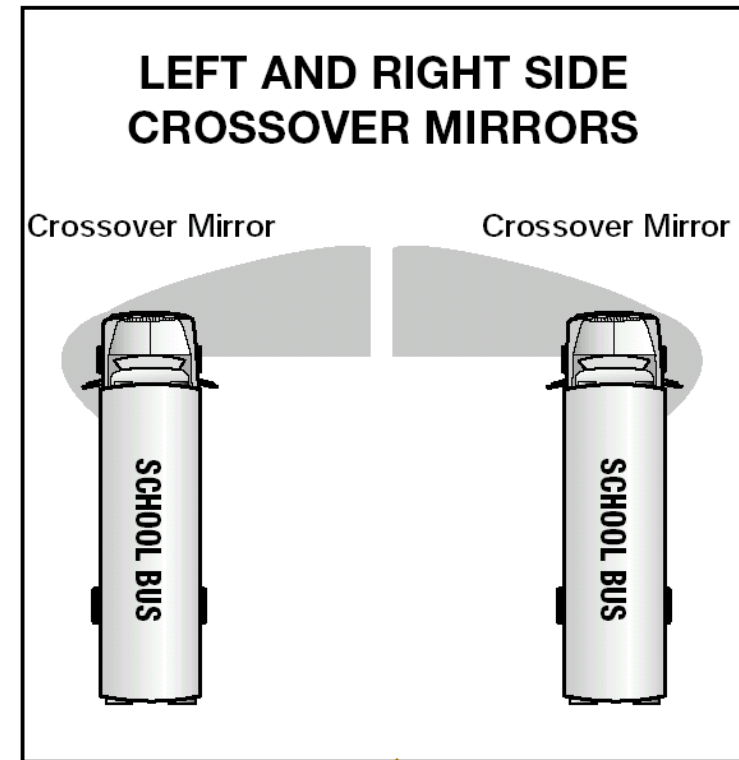
- Located below flat mirrors
 - Used to monitor wide angle
 - To view traffic, clearance, and students to the side of the bus
 - Size and distance not accurate
- You should use them to see
 - The entire side of the bus up to the mirror mounts
 - Front of the rear tires touching the ground
 - At least one traffic lane to the side
 - Correct adjustment shown

LEFT AND RIGHT SIDE CONVEX MIRRORS



LEFT AND RIGHT SIDE CROSSOVER MIRRORS

- Mounted on front corners
- They are used to see the
 - Front bumper danger zone
 - Left/right side danger zones
 - Includes service door /front wheel area
- If properly adjusted, you should see
 - Area in front out to where direct view is possible
 - Front tires touching the ground
 - The area to the service door
- **HOT** – These mirrors, along with the convex and flat mirrors, should be viewed in a logical sequence to check danger zones
- Correct adjustment shown



OVERHEAD INSIDE REARVIEW MIRROR



- Mounted directly over the windshield
 - Used to monitor passenger activity
 - May provide limited visibility to the rear
 - Remember – the blind spot to the rear may be up to 400' – Use exterior side mirrors to see approaching traffic
- If it is correctly adjusted, you should see
 - The top of the rear window at the top of the mirror
 - All students, including heads in the first row

LOADING AND UNLOADING

- More students killed getting on and off the bus-Most dangerous time during a school bus ride
 - Knowing what to do before, during, and after is critical
 - This section is critical in preventing unsafe conditions
 - In addition , you must learn and obey state laws
- Approaching the stop
 - Stops should be approved by school districts
 - Do not change the location without written approval
 - Use extreme caution - Follow state and local regulations regarding mirrors, lights, stop sign and stop arm

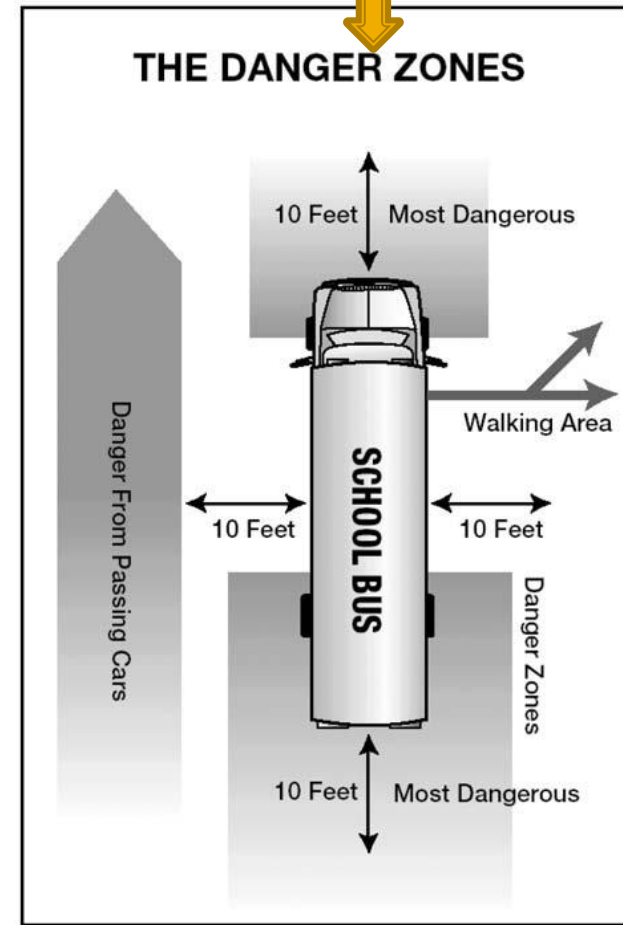
LOADING AND UNLOADING (CONT.)

- When approaching the stop, you should:
 - Approach cautiously and slowly
 - Look for pedestrians, traffic, and objects
 - Continuously check mirrors
 - Activate warning lights (if equipped) by 200' or 5-10 seconds before the stop-Or in accordance with state law
 - Turn on signal at 100-300 feet or 3-5 seconds before stop
 - Check mirrors, traffic, students, and danger zones
 - Move as far as possible to the right on the traveled portion of the roadway

LOADING AND UNLOADING (CONT.)

- When stopping, you should
 - Make a full stop at least 10 feet away from students
 - This keeps children where you can see them
 - Place transmission in park or neutral and set the parking brake at each stop
 - Activate red lights when traffic is at a safe distance
 - Ensure stop arm is extended
 - Finally, make a last check to see that traffic has stopped before opening the door and signaling students to approach

Keep students out of danger zones

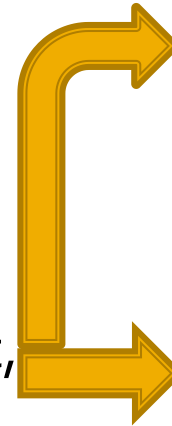


LOADING PROCEDURES

- Perform a safe stop as previously described
 - Students should wait in a designated location
 - Students should board the bus only when signaled to do so by the driver – Do not expect traffic to stop for your lights/sign – Violations are on the rise (see below)

LOADING PROCEDURES (CONT.)

- Monitor all mirrors continuously
- Count the children twice and be sure all board the bus
- Have them board slowly in single file
- Never move until all students are seated and facing forward
- Check mirrors and look for anyone trying to catch the bus
- If you cannot account for a student, check around and under the bus
- When ready to leave – Close door, engage transmission, release brake, turn off lights, check mirrors, and allow congested traffic to disperse



LOADING AT SCHOOL



- Differences when loading at school
 - Turn off the ignition
 - Remove the key whenever you are out of the seat
 - Position yourself to supervise loading as required by state and local regulations

UNLOADING ON THE ROUTE

- In addition to all previously described procedures
 - Have students remain seated until told to get up
 - Check all mirrors
 - Count all students before moving away
 - Tell students to exit and walk at least 10 feet away
 - Check mirrors again and look for students
 - Do not move if you cannot account for all students. Follow local procedures



CHILDREN SHOWN HERE AT 10 FEET AWAY

UNLOADING ON THE ROUTE (CONT.)

- When all students are accounted for
 - Close the door
 - Engage transmission
 - Release parking brake
 - Turn off alternating flashing lights
 - Turn on left signal
 - Check all mirrors
 - Allow congested traffic to disperse
 - When safe, move the bus
- Never back up to pick up or drop off a student-Follow local procedures if a stop is missed

ADDITIONAL PROCEDURES FOR STUDENTS WHO MUST CROSS THE ROADWAY

- If students must cross the roadway
 - You should know what students should do
 - You should know that students may not follow rules
- Procedures for students who cross the road
 1. Walk 10 feet to the right side of the school bus
 2. Walk at least 10 feet in front of the right bumper corner
 3. Stop at the edge of the road-You should see their feet
 4. Stop and look in all directions making sure it is clear
 5. Check to see if the red lights on the bus are still flashing
 6. Wait for your signal before crossing
 7. After you signal, they cross far enough to be seen
 8. Stop at the left edge of the bus-Look and wait for a signal
 9. Finally, they should check traffic and cross the roadway



UNLOADING PROCEDURES AT SCHOOL

- General guidelines when unloading at school
 - Remember- Obey state and local laws
 - Perform a safe stop as previously described
 - Secure the bus-Ignition off and key removed if leaving
 - Have students remain seated until told exit
 - Position yourself to supervise-Follow state/local regs.
 - Have students exit in an orderly fashion
 - Observe students move away from the loading area



UNLOADING PROCEDURES AT SCHOOL (CONT.)

- Walk through the bus-Check for students and items
- Check mirrors and look for returning students
- If you cannot account for a student , check around/under the bus
- When all students are accounted for
 - Close door and fasten seat belt
 - Start engine and engage transmission
 - Release parking brake and turn off flashing lights
 - Turn on signal and check mirrors
 - Allow congested traffic to disperse
 - When safe, pull away

SPECIAL DANGERS OF LOADING/UNLOADING

- Dropped or forgotten objects
 - Always focus on students-Watch for any who disappear from sight
 - Stopping or returning to pick up objects may cause them to disappear
 - Students should be told to get the driver's attention concerning any dropped objects before retrieval
- Handrail Hang-ups
 - Watch for clothing, body parts, and accessories as they exit the bus

POST-TRIP INSPECTION

- Walk through and around the bus and look for
 - Open windows and doors
 - Articles left on the bus
 - And most importantly, sleeping students
 - Damage or vandalism
 - Mechanical or operational problems with the bus
- Report any problems / situations immediately



EMERGENCY EXIT AND EVACUATION

- Emergencies can happen anytime or anyplace
- Knowing what to do can mean the difference between life and death
- Determine the need to evacuate the bus
 - Generally students are safer on the bus
 - The decision to evacuate should include the following
 - Danger of fire or smell of leaking fuel
 - Chance of the bus being hit by vehicles
 - Bus is in the path of a tornado or rising water
 - Downed power lines-Would removing them be more/less dangerous
 - Complications of injuries such as neck or back
 - Hazardous spills

MANDATORY EVACUATION

- The driver must evacuate when
 - The bus is on fire- Also threat of fire
 - The bus is stalled on or adjacent to a railroad crossing
 - The position of the bus may change and increase danger
 - Imminent danger of collision
 - Need to evacuate for a hazardous spill

EVACUATION PROCEDURES

- Be prepared and plan ahead
 - When possible, assign two responsible older students to each emergency exit
 - Teach students to assist ahead of time
- Assign another student to lead them to a safe place after evacuation
- Explain procedures to all students
 - They should all know how to operate emergency exits and how to follow instructions



TIPS TO DETERMINE A SAFE PLACE

- Tips include
 - At least 100' off the road in the direction of oncoming traffic
 - Upwind of the bus if fire is present
 - Away from railroad tracks in the direction of the train
 - Upwind at least 300' of any hazardous materials
 - In the case of a sighted tornado , evacuate to a building or ditch (face down) if a building is not available

GENERAL EVACUATION PROCEDURES

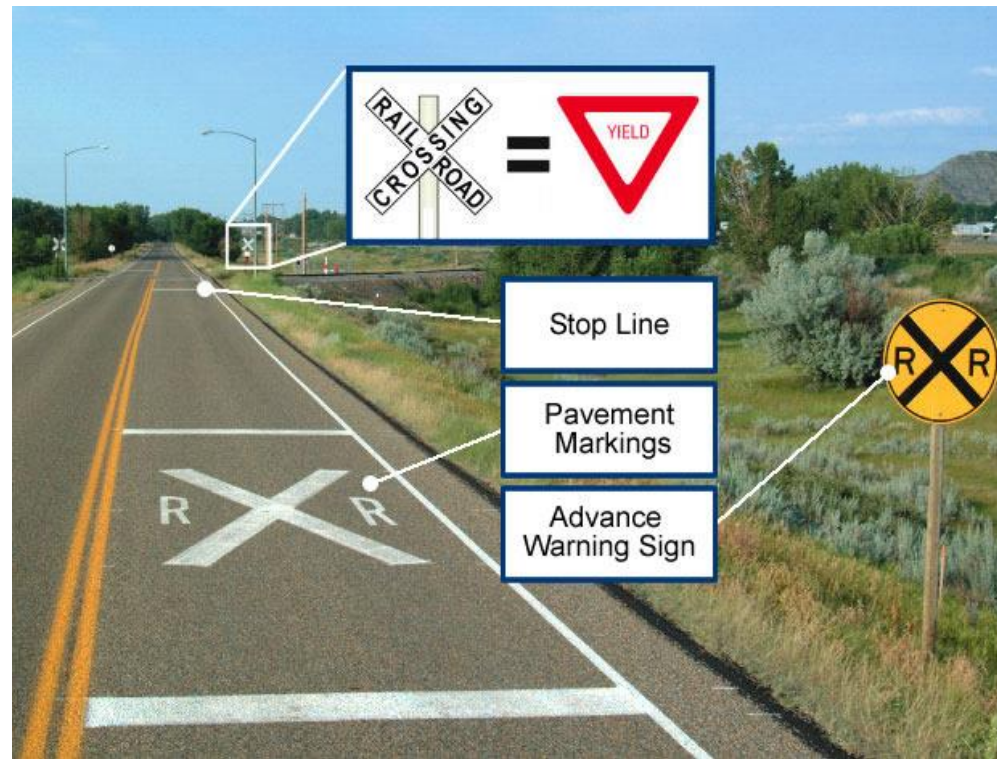
- Determine if it is in the best interest of safety
 - Determine the best type-Front, rear or side door
 - Roof or window
 - Secure the bus-In park/neutral, set brake, engine off, remove key, and activate hazard lights
 - Call for help and notify dispatch if time allows
 - Dangle radio microphone out window for later use
 - If no radio dispatch, a passing motorist to call for help
- Finally, order the evacuation

EVACUATING STUDENTS FROM THE BUS

- Do not move any student who has a neck or spinal injury unless there is imminent danger
 - These injuries require special procedures
- Have a student assistant lead students to a safe place
- Walk through the bus to be sure everyone is gone
- Retrieve emergency equipment
- Join students, count them, and check their safety
- Protect the scene and set out emergency warning devices
- Collect information for first responders

RAILROAD-HIGHWAY CROSSINGS

- Types of crossings
 - Passive crossing
 - Does not have any control device (gates/signals)
 - Requires you to
 - Recognize the crossing
 - Search for any train
 - Stop, look, and listen
 - Determine if there is sufficient clear space to cross



RAILROAD-HIGHWAY CROSSINGS (CONT.)

- Active crossings
 - Has a traffic control device to regulate traffic
 - May have flashing red lights, bells, and gates



RAILROAD-HIGHWAY CROSSINGS (CONT.)

- Warning signs and devices
 - Advance warning sign – Round black on yellow – Tells you to slow down, look, and listen
 - Pavement Markings-Same meaning as the advance warning sign-Also may include a no passing zone and a stop line. The front bumper must remain behind the stop line when stopping for the crossing



RAILROAD-HIGHWAY CROSSINGS (CONT.)

- Cross-buck signs – Marks the crossing and requires you to yield to the train
 - If there is no stop line, you must stop before the sign
 - Also indicates multiple tracks
- Flashing red signal-Stop on red-Make sure all tracks are clear if applicable
- Gates-Stop on lights even if the gate is not down yet-Remain stopped until gate is up/lights off
- Never drive around the gate



RAILROAD-HIGHWAY CROSSINGS (CONT.)

- Recommended Procedures
- Obey all state laws-Each state varies slightly but School Buses must stop at all railroad crossings
- The train cannot stop quickly or steer-Follow these procedures to prevent crashes
 - Approaching the crossing
 - Slow down, shift if needed, and test brakes
 - Hazard lights on by 200' – Make sure your intentions are known
 - Scan surroundings, check traffic, and stay to the right if possible
 - Choose an escape route in case of brake failure or problems

RAILROAD-HIGHWAY CROSSINGS (CONT.)

- At the crossing
 - Stop at 15' to 50'
 - Shift to park or neutral and press down on the service brake or set the parking brake
 - Turn off noise, open door, open window, and look/listen for a train
- Crossing the track
 - Check crossing signal again
 - At multiple tracks, make sure all tracks are clear
 - Stay in low gear and do not shift
 - If the gate comes down after you are on the tracks, continue moving even if it will break the gate



RAILROAD CROSSINGS-SPECIAL SITUATIONS

- Special situations
 - Bus stalls on track
 - Evacuate immediately
 - Move everyone at an angle, both away from the tracks and toward the train
 - Police officer at the crossing- Obey the officer
 - If no officer and you suspect a malfunctioning gate
 - Call for help-Do not drive around gate
 - Obstructed view-Plan your route for maximum sight
 - Do not attempt to cross unless you can see
 - Be especially careful at “passive” crossings
 - Even with signals, you must look and listen
 - Containment or storage areas-If it won't fit, don't commit
 - Know the length of your bus-Pay attention to the amount of room in and on the opposite side of any intersections
 - Make sure you have the length of the bus plus 15 feet before proceeding

STUDENT MANAGEMENT

- Don't let student problems distract you
 - Loading and unloading-Keep your eyes on the students
 - When driving-Concentrate on the driving task
 - If necessary, pull over to handle problems
- Serious problems
 - Follow your school's procedures
 - Stop the bus in a safe location-Take key if out of seat
 - Speak in a firm but respectful voice-Do not show anger
 - Move students to other seats near you as needed
 - Never put a student off the bus at other than designated stops-If the situation is serious enough, call for help

ANTILOCK BRAKES



- ABS required
 - All air brake vehicles built after March 1, 1998
 - Hydraulic brake buses and trucks over 10,000 lbs. built on or after March 1, 1999
 - If your bus is equipped, it will have a yellow malfunction lamp on the instrument panel
- How ABS helps you
 - Keeps wheels from locking up during hard braking
 - With wheels locked, you lose steering control and may skid-With ABS, you can still steer around obstacles during hard braking

ANTILOCK BRAKES (CONT.)



- Braking with ABS
 - Use only braking force needed to stop
 - Do not pump the brakes
 - As you slow down, back off the brakes to stay in control
- Braking if ABS is not working
 - Without ABS, you still have normal brake function
 - Malfunction indicated by yellow lamp
 - Light test will cause it to come on when starting
 - On older systems, the lamp may stay on until you move (5mph)
 - If the lamp stays on, you may have lost ABS-Drive normally but get it serviced as soon as possible

SAFETY REMINDERS (ABS)



- Safety reminders for ABS
 - Won't allow you to drive faster or follow closer
 - Won't prevent power or turning skids
 - May not shorten stopping distance
 - Won't change ultimate stopping power
 - Does not change the way you normally brake
 - Won't compensate for bad brakes
 - The best safety feature is a good driver
 - Drive so you never need ABS
 - If you do need ABS, it may help you maintain control and avoid a serious crash

SPECIAL SAFETY CONSIDERATIONS

- Strobe lights
 - Should be used in limited visibility
- High winds
 - Winds affect handling of the bus
 - Can cause the bus to move or tip
 - Keep a firm grip on the wheel and try to anticipate gusts
 - Slow down and/or pull off the roadway
 - Contact your dispatcher for information on how to proceed

SPECIAL SAFETY CONSIDERATIONS (CONT.)

- Backing
 - Strongly discouraged-Back only when no other choice
 - Never back with students outside the bus
 - If you must back
 - Post a lookout
 - Signal for quiet on the bus
 - Check all mirrors constantly-Back slowly and smoothly
 - If no lookout available-Set the brake, turn off bus, take keys, and walk to the rear of the bus to check if clear
 - At a pick-up point, pick-up before backing
 - At a drop-off point, unload after backing
- Tail swing-May have up to 3' tail swing-Check mirrors